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DISEASES CAUSED BY BACTERIA AND FUNGI.

SAVICKIS, J. (1934). Astrieji parenchymatoziniai karvie tesmens uzdegimai. [**Acute Mastitis in Cows**].—*Vet. ir Zootech. Kovno.* **11.** 33-40. [16 refs.] [Abst. from German summary].

According to the annual report for 1933 of the State Veterinary Bacteriological Institute at Kovno, investigations were made into 120 cases of bovine mastitis. The infection was caused by *Bact. coli* in 72·5 per cent. of cases, micrococcus in 10 per cent., streptococcus in 8·3 per cent., staphylococcus in 3·3 per cent., and *Corynebact. pyogenes* in 2·5 per cent.

Mastitis due to *Bact. coli* usually runs an acute course with general disturbances, but subacute and chronic forms are also seen.—J. E.

I. STYLIANOPOULOS, M. (1934). Contribution à l'étude des mammites chez la vache et fréquence du streptocoque hémolytique dans la mammite streptococcique. [**Bovine Mastitis and the Frequency of Haemolytic Streptococci in Mastitis**].—*Ann. Med. vét.* **79.** 19-26. 2 tables. [1 ref.]

II. HAUPT, H. (1933). Ueber die Benennung des Streptococcus agalactiae und den Glukosezusatz zur Brownschen Blutplatte. [**The Nomenclature of** *Streptococcus agalactiae* **and the Addition of Glucose to Brown's Blood Plates**].—*Zlb. Bakt. I.* (*Orig.*). **130.** 53-54. [4 refs.]

III. BUSS, & MÖLLER. (1934). Beitrag zur frühzeitigen Erkennung von Euterkrankheiten. [**Early Diagnosis of Mastitis**].—*Tierärztl. Rdsch.* **40.** 190-194. 2 tables. [49 refs.]

I. Of 1,471 milking cows in 92 herds, which were under observation from March to November, 1933, 207 (14 per cent.) showed clinical symptoms of mastitis. Of these 207 cases, 138 were due to streptococci, 20 to staphylococci, 16 to coliform bacteria, 13 to *Corynebact. pyogenes*, 4 to *Mycobact. tuberculosis* and 7 to other organisms, whilst in 9 other cases no organisms could be found.

Sixty strains of streptococci were further examined ; 15 per cent., most of which were from acute cases, were of *Str. pyogenes* nature, whilst 36·6 per cent. were apparently *Str. agalactiae*, and 35 per cent. of other nature ; both of these latter groups were from chronic cases.

It is stated that clinical streptococcus mastitis is not more frequent at the extreme periods of lactation, relatively rare from the 15th to the 60th day after

calving and most common from the 60th day to the commencement of the drying stage. [The author's figures show, however, that the incidence of mastitis during the first 15 days was more than four times and, during the drying period, more than twice the incidence which would be expected if cases had been distributed evenly throughout the lactation period, whilst in the period from the 60th day till the commencement of drying it was actually less than would have been expected].

II. Haupt believes that the name *Str. agalactiae* should be confined to α haemolytic strains. He affirms that the addition of 0·05 per cent. glucose does not hide the β organism appearance.

III. From observations made on samples from 835 cows which were also examined clinically, Buss and Möller conclude that the so-called rapid tests for the diagnosis of mastitis are of great value in its early detection, but cannot supplant bacteriological methods. The combined test for reaction and catalase with a mixed thybromal hydrogen peroxide reagent is the most sensitive method, but indicator papers are preferred on grounds of simplicity and cheapness.

—A. W. Stableforth.

Lancefield, Rebecca C. (1934). **A Serological Differentiation of Specific Types of Bovine Hemolytic Streptococci (Group B).**—*J. exp. Med.* **59.** 441-458. 6 tables. [9 refs.]

In a previous paper [this *Bull.* **4.** 199.] it was shown that haemolytic streptococci isolated from human beings, lower animals, and dairy sources could be differentiated serologically, by means of precipitation tests carried out with extracts made with hot N/20 HCl, into groups which corresponded in general to those based on cultural and biochemical characteristics. The present paper deals further with haemolytic streptococci derived from bovine mastitis or from normal milk, group B of the previous paper, and shows that these strains can be further subdivided into three specific types. For this purpose sera with a relatively high content of specific antibodies as compared with group antibodies were required. They were often obtained by giving repeated series of small doses of formalinized streptococci but, when necessary, selective absorption with another member of the same group was used to render them monospecific. Extracts were prepared as before. The agglutination method was also tried but was dropped because considerable cross-agglutination between the types as differentiated by the precipitation method was encountered. It is not yet known whether these types correspond with those found amongst mastitis streptococci by Stableforth [this *Bull.* **3.** 586.] using similar methods.

Chemical examination of the type-specific substances of two types within this group showed that they were polysaccharides (S substances). The group-specific substance C, serologically similar in all numbers of the group, is also of polysaccharide nature. The polysaccharide nature of the type-specific substances of this group contrasts with the protein nature of the type-specific substances of human strains described earlier.—A. W. Stableforth.

Edwards, P. R. (1934). **Characters of Haemolytic Streptococci Isolated from Pathological Conditions in Fowls.**—*J. comp. Path.* **47.** 152-157. 3 tables. [11 refs.]

Edwards has examined 12 strains of haemolytic streptococci from fowls, eight from infection secondary to slipped tendon, one from a case of apoplectiform septicaemia and three from bronchitis of baby chicks. All strains belonged to the class of haemolytic streptococci which produce low acid in sugar media, do not hydrolyze sodium hippurate, and produce large amounts of soluble haemolysin.

Using the tests which he had previously devised for this group (fermentation of lactose, sorbitol, trehalose and reduction of methylene blue) and the group precipitation method of Lancefield, it was found that the haemolytic streptococci from cases of slipped tendon and the cases of apoplectiform septicaemia had the characters of " animal streptococci " whilst those from bronchitis of baby chicks had the characters possessed by " human streptococci."—A. W. STABLEFORTH.

PILLERS, A. W. N. (1934). **Remarks on the Clinical Aspects of Contagious Nasal Catarrh in Horses.**—*Vet. Rec.* **14.** 1153-1160.

The title of this paper may be misleading, as the whole field of activity of *Streptococcus equi* is covered. The author emphasizes the close connection existing between various diseased conditions of the upper air passages of the horse, which he prefers to regard as clinical aspects of one disease. He reviews the clinical features of nasal catarrh, dealer's cold, strangles and laryngitis as met with among commercial horses to-day. The recognized complications and sequelae are considered, cardiac disability receiving special attention. ARNOLD's contention that grazing ensures freedom from severe guttural pouch infection is disputed. The author finds that catarrhal symptoms persist if affected horses are subjected to treatment by inhalations repeated daily. He favours a single inhalation with one drachm each of menthol and thymol in a quart of hot water or medicated emollient applied around the inside of the nostril.—C. DAVENPORT.

CASTAGNOLI, B. (1934). Caratteri del B. anthracis coltivato in terreno Petragnani (Studio microbiologico). [**Characters of** *B. anthracis* **in Petragnani's Medium**].—*Profilassi.* **7.** 294-299. 2 figs. [5 refs.] [Abst. from French and German summaries].

B. anthracis, when sown on Petragnani's medium, rapidly turns it dark green and then yellow after five or six days at 37°C. After 20 days' growth on this medium, involution forms develop and, as age increases, spores are no longer formed. The pathogenicity becomes attenuated.—J. E.

I. GRIFFITH, A. S. (1934). **Incidence of Human and Bovine Bacilli in Tuberculous Meningitis.**—*Lancet.* **226.** 1382-1387. 2 tables. [9 refs.]

II. MCCALLUM, G. B., & KIRKPATRICK, J. (1934). **Tuberculosis in the Hebrides : The Rarity of Tubercle Bacilli in the Milk of Cows with a Note on the Vitality of Tubercle Bacilli Preserved in Frozen Milk.**—*J. Hyg., Camb.* **34.** 141-143. [5 refs.]

I. In 1932, the author summarized the results of typing strains of tubercle bacilli obtained from 140 cases of tuberculous meningitis. Of 77 cases from which the material had been obtained at necropsy the incidence of bovine infection was 15 (19·5 per cent.) ; of the 63 obtained from cerebrospinal fluid drawn during life, 19 (30·2 per cent.) were of bovine type. The investigation has been continued with the object of ascertaining the relative incidence of the human and bovine types in tuberculosis in England and Scotland. Of the 188 new cases here recorded, 151 were from England and 33 (21·8 per cent.) were of the bovine type ; 37 were Scottish cases of which 15 (40·5 per cent.) were of bovine type. The bovine cases were widely distributed, country places and small towns giving in general a higher frequency than cities. Combining the figures for England and Scotland with 63 of these cases previously reported, it is shown that there is a high incidence of bovine infection during the second and third years of life. A high incidence is also recorded during the seventh year of life, but this may be fortuitous as the author points out that it is based on a small number of cases.

Attempts were made to trace the source of the infections with the bovine type by making enquiries into the milk supply. In a few instances the enquiries led to the discovery of cows that were giving tuberculous milk, but it is pointed out that such enquiries could only be expected to be fruitful where the interval between infection and disease was short.

II. The authors examined 252 specimens of milk taken from individual cows from various parts of the Hebrides. In no case were acid-fast organisms found in films nor were tubercle bacilli demonstrated either by cultivation or by the production of tuberculous lesions in guinea pigs. As it was not possible to examine all the specimens immediately, they were kept frozen at about -8° to -20°C. before further treatment and, as the last specimens had been kept frozen for one year and nine months before examination, it was necessary to exclude the possibility that the vitality of any tubercle bacilli present might have been damaged. Accordingly, guinea pigs were inoculated at intervals with a sample of tuberculous cows' milk kept under similar conditions for a period up to two years and eight months. All the guinea pigs developed tuberculous lesions.

Taking into account the apparent absence of bovine infection and the high prevalence of severe pulmonary tuberculosis amongst young adults in these islands, the authors argue that bovine tuberculosis appears to play no part in the causation of the human condition, and that possibly the absence of bovine tuberculosis may play an indirect part in conducing to a severe form of the human disease, owing to lack of immunity conferred in man against the latter by bovine infection. They quote the literature showing the association of high mortality from human tuberculosis together with the low incidence of the disease in cattle in Norway, Northern Sweden, Finland, the Faroe Islands, Iceland and Greenland.

—R. Lovell.

I. Angelo, A. (1933). Action de la température sur la vitalité de différentes souches de Bacilles tuberculeux et paratuberculeux. [**Action of Temperature on the Vitality of Different Strains of** *Mycobacterium tuberculosis* **and** *M. paratuberculosis*].—*C. R. Soc. Biol. Paris.* **113.** 1415-1417. [3 refs.]

II. Liverani, E. (1934). Passage des Bacilles tuberculeux aviaires, humains ou bovins dans les oeufs de Poules infectées. [**Passage of** *M. tuberculosis*, **Avian, Human or Bovine Strain, in the Eggs of Infected Hens**].—*Ibid.* **115.** 133-134.

I. Differences exist in the resistance to heat of strains of tubercle and other acid-fast bacilli. For example, tubercle bacilli of human type, when suspended in saline, resisted 62°C. for 20 minutes, whilst the bovine type resisted 60°C. for 20 minutes. BCG resisted 56°C. for 15 minutes, whilst *M. phlei* resisted 72°C. for 30 minutes and Grassberger's bacillus 60°C. for 20 minutes. When the suspensions were mixed with diluted horse serum or milk, their heat resistance was reduced. Tests were carried out by subcultures on to Petroff's medium.

II. It is concluded, as a result of several experiments, that the avian type of tubercle bacillus may frequently pass into the eggs and genital organs of birds which are naturally or artificially infected with avian tuberculosis. Further, it is shown that tubercle bacilli of the bovine type, when inoculated in large doses, may be isolated many days later from the same organs and from eggs. It is, therefore, possible that fowls which live in contact with cattle suffering from tuberculosis may become contaminated with tubercle bacilli of the bovine type.

—R. Lovell.

JANIK, F. (1934). Ueber nichtsäurefeste Gebilde in Tuberkelbazillenreinkulturen. (Beitrag zur Kritik der zyanophilen Substanz). [**Non-Acid-Fast Forms in Pure Cultures of** *Mycobacterium tuberculosis*].—*Zlb. Bakt. I. (Orig.).* **131.** 462-468. 2 figs. [19 refs.]

Colonies of *M. tuberculosis*, grown on Löwenstein's malachite green medium, were embedded in paraffin and sections were cut. Sections showed the colonies to be built up of acid-fast and non-acid-fast members. The non-acid-fast units showed marked polymorphism. Sections were stained by Ziehl-Neelsen's method at 37°C. Material stained in this way cannot be compared with sections stained over an open flame.—E. J. PULLINGER.

STEENKEN, W., Jr., OATWAY, W. H., Jr., & PETROFF, S. A. (1934). **Biological Studies of the Tubercle Bacillus. III. Dissociation and Pathogenicity of the R and S Variants of the Human Tubercle Bacillus (H37).**—*J. exp. Med.* **60.** 515-540. 19 figs. on 3 plates. [15 refs.]

The virulence of a culture is dependent upon the relative proportion of virulent to non-virulent organisms in the culture. Assuming that the virulence of individual organisms was influenced by the environment in which the organisms were grown, the authors grew a strain of tubercle bacillus (H37) which had been in constant use for many years on various media and eventually succeeded in isolating two extreme types of variants. The R type was practically avirulent and non-pathogenic, inoculated animals killed after four to six weeks containing few or no lesions. The S variant was very virulent and pathogenic, producing large wide-spread lesions of a progressive type – necrosis, caseation and abscess formation.

With complete dissociation, the colonies were distinctive and typical, and the individual organisms constituting the two types revealed morphological appearances peculiar to the variant. The R variant grew best in an acid medium and the S variant best in an alkaline medium.

During the experiments it also became evident that the relative age and weight of the laboratory animals used had no effect on the course of the disease. The sex only influenced the results in so far as it affected the routes of infection.

—GWILYM O. DAVIES.

TRAIN. (1934). Contribution à l'Etude du Traitement et du Diagnostic de la Lymphangite ulcéreuse. [**A Contribution to the Study of the Treatment and of the Diagnosis of Ulcerative Lymphangitis**].—*Rev. vét. milit.* **18.** 355-362. 3 tables.

The first part of this paper is an account of the treatment of two cases of ulcerative lymphangitis by vaccination. Improvement was rapid and a complete cure was effected within a month. Details are given of the method of preparation of the vaccine, but not of the composition or bacterial strength of the doses employed.

The second part of the paper deals with two series of tests carried out with a reagent termed "preisznocardine," the filtrate of a broth culture of the causal organism. In the first series of tests the filtrate was used untreated. All horses injected gave a reaction, whether healthy, affected with ulcerative lymphangitis, or with other diseases. In the second series the filtrate was subjected to 70°C. for one hour before use. No case of ulcerative lymphangitis was available for testing, but horses suffering from various other diseases were injected. A reaction was obtained in one horse only, a case of simple lymphangitis, which the author suggests may have harboured the Preisz-Nocard bacillus [*Corynebacterium pseudo-tuberculosis*] at some previous date.—C. DAVENPORT.

YEGIAN, D. M. (1934). **Corynebacterium Infection in Poultry.**—*J. Amer. vet. med. Ass.* **85.** 220-223. 2 tables.

The author records the recovery of an organism belonging to the genus *Corynebacterium* from the liver, spleen, pericardial fluid and heart of a fowl which died suddenly. A description is given of the cultural and morphological characters of the organism, and of the lesions seen on *post-mortem* examination. Inoculation experiments with saline suspensions of the organism showed that at times the organism is pathogenic for fowls and in large doses for chickens and guinea pigs. It appeared to possess slight antigenic properties.—R. F. GORDON.

HOWARTH, J. A. (1933). **Polyarthritis of Sheep.**—*N. Amer. Vet.* **14.** No. 9. 26-39. 7 figs., 5 tables. [17 refs.]

The disease referred to is a chronic arthritis and synovitis followed by secondary changes in the musculature of the affected limb. Other authors have studied the same disease and several have come to the conclusion that the aetiological agent is the swine erysipelas bacillus [*Erysipelothrix rhusiopathiae*]. In California, where the author has carried out his investigations, the disease usually affects lambs after docking and castration. Indirect evidence points to soil infection. The incidence in individual flocks varies from 1 to 10 per cent.

Pathological changes in the affected joints include a proliferative inflammation of the synovial membrane, erosion of hyaline cartilage, rarefaction of the bone and replacement of joint fluid by a light, yellowish-green, gelatinous exudate.

The carbohydrate reactions of 13 strains were studied and they were found to ferment dextrose, lactose and maltose, contrary to the common behaviour of *E. rhusiopathiae* from pigs, but in accordance with that of strains from sheep as reported by CORNELL and GLOVER [(1925). *Vet. Rec.* **5.** 833]. The sera of infected animals agglutinated suspensions of the isolated organism and of *E. rhusiopathiae* to titres higher than 1 : 40. Rats and pigeons could be infected experimentally, but guinea pigs and rabbits appeared to resist infection. Lambs could be infected by intravenous inoculation and by artificial contamination of docking or castration wounds. Attempts to infect swine with the organism isolated from lambs were unsuccessful. [From the negative results following inoculation of swine with the ovine strains, the author concludes that there is an inherent difference in the two organisms. The evidence appears to be unsound, because he also failed to produce disease in swine with stock strains (German) of *E. rhusiopathiae*]. Inoculation of lambs with the German strains produced a disease indistinguishable from the polyarthritis described.—R. S. ROBERTS.

MANNINGER, R. (1934). Ueber den Erfolg der staatlichen Bekämpfung des Geflügeltyphus und der Geflügeltuberkulose in Ungarn in den Jahren 1928-1932. [**Control of Fowl Typhoid and Tuberculosis in Hungary 1928-1932**].—*Berl. tierärztl. Wschr.* **50.** 210-213. 3 tables. [2 refs.]

The control of the two conditions was attempted in a gradually increasing number of flocks, during the course of five years. Finally there were 182 flocks, containing 50,000 birds, under control.

Diagnosis of fowl typhoid was based upon the agglutination test, birds being generally tested twice during the year. [See this *Bull.* **5.** 6. for a note regarding the nomenclature of these bird diseases used by the German-speaking authors].

By the end of five years, 145 out of 182 flocks were free of infection, but it is noticeable that there was practically no fall in the number of infected flocks in the first group (i.e. those which were under control for five years); on the other

hand, all succeeding groups showed a marked decrease in percentage of infected flocks from year to year.

The figures indicate that a campaign against the disease can make rapid progress, and that the efficiency of the diagnostic method is not the only factor controlling the rate of improvement. The value of control over a short period is indicated by the group commenced in 1930. Here the number of clean flocks increased from 26 to 44 in 1932.

Diagnosis of tuberculosis was based upon the intradermal tuberculin test, as well as upon clinical examination. When new groups were first examined it was found that 10 to 12 per cent. of flocks were infected. After state control this figure was reduced to 5 to 8 per cent. The number of tuberculin tests carried out on flocks varied from one to four within a year.—E. J. PULLINGER.

BELLER, K., & ZEKI, M. (1934). Zum Vorkommen von Bakterien aus der Ruhr- und Paratyphusgruppe beim Haushuhn. [**Dysentery and Paratyphoid Bacteria in the Domestic Fowl**].—*Dtsch. tierärztl. Wschr.* **42.** 273-275. 2 tables. [13 refs.]

The cultural examination of material from 531 fowls, dead from different causes, revealed only five paratyphoid strains of organism which did not ferment lactose. Biochemically these strains fell into three groups. Serologically they were all agglutinated by *Salmonella pullorum* antiserum, three by anti-Gärtner serum, three by anti-Schottmüller serum, and one by anti-Breslau serum. There was no agglutination by anti-Shiga or anti-Flexner serum. [The significance of these results cannot be judged since no differentiation between somatic and flagellar agglutination was made].—E. J. PULLINGER.

—. (1934). **The Genus *Salmonella* Lignières, 1900. Issued by the Salmonella Subcommittee of the Nomenclature Committee of the International Society for Microbiology.**—*J. Hyg., Camb.* **34.** 333-350. [148 refs.]

At the First Congress of the International Society for Microbiology in July, 1930, a Nomenclature Committee was appointed and the above is a report issued by the Sub-Committee appointed to deal with the question of taxonomy and nomenclature of the salmonella group. The generic name *Salmonella* Lignières 1900 is accepted and the definition is as follows :–

"A large genus of serologically related, Gram-negative and non-sporing bacilli ; $0{\cdot}4$-$0{\cdot}6\mu \times 1$-3μ in usual dimensions, but occasionally forming short filaments ; showing, with certain exceptions, a motile peritrichous phase in which they normally occur ; in fact, adhering to the pattern of *B. typhosus* in staining properties and morphology. Failing to ferment lactose and saccharose, to clot milk, to liquefy gelatin or to produce indole, they regularly attack glucose with, but occasionally without, gas production. All the known species are pathogenic for man, animals, or both."

The classification employed (The Kauffmann-White Schema) is based on that presented by KAUFFMANN, and the antigenic structure is indicated as follows :–

The thermostable O-antigen is in Roman numerals, the specific H-antigen in small letters and the unspecific H-antigen in Arabic numerals. Examples as below :–

Group	*Species*	*O-antigen*	*H-antigen*	
			specific	*non-specific*
B	*S. abortus-equi*	IV	enx	—
C	*S. cholerae-suis*	VI VII	c	1,3,4,5

A complete list of 44 species is given followed by lists of synonyms. For example, *Salmonella typhi-murium* is the recognized name for those strains hitherto recorded by British workers as *Bact. aertrycke* and *Bact. enteritidis* Breslau by

German workers. *Salmonella abortus-equi* and *S. abortus ovis* are easily recognized whilst *Bact. suipestifer* becomes *S. cholerae-suis* the European variety being *S. cholerae-suis* var. *Kunzendorf*. *Bact. enteritidis* is *S. enteritidis* and the Dublin, Rostock and Moscow types are now known as varieties of *S. enteritidis*. *S. gallinarum* and *S. pullorum* are listed as separate species in spite of their antigenic identity, but because of their well-marked cultural differences.

There is an excellent list of references and the report should introduce some manner of stability in a group hitherto confusing to the uninitiated.—R. LOVELL.

ITO, S. (1934). **The Influence of S-Compounds on the Growth of** *Bacterium pullorum*.—*J. Jap. Soc. vet. Sci.* **13.** 207-212. 2 figs. on 1 plate, 3 tables. [3 refs.] [In Japanese : abst. from English summary].

The author tested the action of 18 compounds of sulphur on the growth of cultures of *Bact. pullorum*.

Nine unstable compounds were found to favour growth, particularly sodium thiosulphate and sodium sulphate. As a good culture medium Ito recommends 2 per cent. agar (pH 7·4) to which either of the above two S compounds has been added in a concentration of 0·5 per cent.—J. E.

PRÖSCHOLDT, O. (1934). Versuche über die natürliche Uebertragung des Bacterium pullorum unter erwachsenen Hühnern und Feststellungen über die Beeinflussung der Agglutination infizierter Hühner durch die physiologische Tätigkeit der Ovarien. [**Natural Transmission of** *Bact. pullorum* **Among Hens, and the Influence of Egg-Laying on the Agglutination Titre**].—*Berl. tierärztl. Wschr.* **50.** 465-467. [3 refs.]

After a three month period of segregation, during which time five non-infected hens, five infected hens, and one infected cock were examined regularly, all birds were brought together into a single pen. Within two months all the healthy birds had become infected, and it was shown that an increase in the egg-laying activity of a bird was accompanied by a rise in titre of specific agglutinins. In a further experiment the infected cock was removed, and more healthy chicks were introduced into the flock. Infection amongst the new stock was less extensive, suggesting the role which an infected cock may play in the spread of the disease. Evidence of infection was based upon the agglutination test and upon culture of cloacal material.—E. J. PULLINGER.

I. NORRIS, J. H. (1934). **The Influence of Old Strains of** *Br. abortus* **upon Pregnant Heifers.**—*Vet. Rec.* **14.** 623-631. 2 tables, 10 charts. [2 refs.]

II. SMITH, J. (1934). **Excretion of Br. abortus in Milk.**—*J. comp. Path.* **47.** 125-133. 6 tables. [15 refs.]

III. PROUTY, C. C. (1934). **Studies on the Leucocyte Content of Milk Drawn from Brucella abortus Infected Udders.**—*J. Bact.* **27.** 293-301. 1 table. [15 refs.]

I. The experience of Norris and other observers in the Irish Free State strongly suggests that live abortion vaccine, prepared from old cultures of the organism, brings about a considerable reduction in the average incidence of abortion and sterility in brucella-infected herds. The difficulty of assessing accurately the value of the vaccine under field conditions, where uninoculated controls cannot usually be provided, is recognized.

This report deals mainly with the results obtained from the inoculation of ten in-calf heifers with live abortion vaccine. Five strains of *Br. abortus* were used separately in the preparation of the vaccines ; these strains had been grown

continuously for 15 years on artificial media. They were no longer capable of inducing lesions in guinea pigs, but caused the production of serum agglutinins up to a titre of about 1 : 100.

The results of the inoculation of the heifers are shown in the following table :–

Heifer.	Days Pregnant.	Vaccination. Dose.	Vaccination. Strain.	Pregnancy Terminated by.	Condition of Afterbirth.
8	107	50 c.c.	171	Abortion 190th day	(Foetus Positive).
9	240	50 c.c.	122	Live calf 288th day	Not examined.
	268	50 c.c.	" King "		
10	184	100 c.c.	122	Live calf 285th day	Normal.
11	162	100 c.c.	" King "	Live calf 295th day	Not examined.
12	89	50 c.c.	" King "	Live calf 280th day	Normal.
13	142	100 c.c.	171	Live calf 283rd day	Normal.
14	123 ?	100 c.c.	212	Live calf 257th day ?	Normal.
	190 ?	50 c.c.	212		
15	130	100 c.c.	172	Death 261st day	Normal.
	207	50 c.c.	172		
16	204	50 c.c.	172	Live calf 281st day	Normal.
17	195	50 c.c.	212	Live calf 288th day	Not examined.

The author concludes from the results obtained from the inoculation of the heifers that live abortion vaccine in the usual doses causes an infection in all animals and in some instances can give rise to abortion and udder infection. He considers that in a high percentage of cases the inoculation of pregnant animals with vaccines prepared from *Br. abortus* strains of low virulence does not produce clinical symptoms, although infection usually appears to persist for a year or more. For these reasons the author stresses the undesirability of the inoculation of pregnant animals with so-called " avirulent strains " of brucella. The vaccination of the ten heifers did not appear to have any adverse influence on fertility.

II. Smith carried out an investigation to determine by means of guinea pig inoculation the incidence of *Br. abortus* in the milk of individual cows. Two guinea pigs were used for each sample of milk and each received subcutaneously 3 c.c. of the centrifuged deposit of 50 c.c. of milk suspended in 6 c.c. normal saline solution. The guinea pigs were killed after four and eight weeks respectively.

Observations were made on (1) a herd of 84 cows that had been vaccinated one or two years previously with live abortion vaccine and (2) on milk samples, from individual cows, sent for examination for tubercle bacilli.

Out of 287 milk samples from individual cows, 33, or 11·5 per cent., were found to contain *Br. abortus* and, from 203 random samples of milk from individual cows, 23, or 11·3 per cent., contained *Br. abortus*. Smith considers that a whey agglutinin titre of 1 : 200 or higher is significant of the excretion of *Br. abortus*.

III. Prouty made a study of the leucocyte content of the milk from 18 cows naturally infected with *Br. abortus*. The milk was obtained from cows in the middle period of lactation. Thirteen of the cows harboured *Br. abortus* in one or more quarters of their udders ; two were infected in all quarters and seven in only one quarter. An average leucocyte content was found to be 145,000 and 185,000 per c.c. for the milk samples from the *Br. abortus* infected and non-infected quarters respectively.

Prouty concludes that there are no significant differences between the leucocyte counts of milk from *Br. abortus*-infected udders and of milk from animals free from that disease.—T. M. Doyle.

GRONAU. (1934). Praktische Erfahrungen mit Abortus-Chinosol-Vakzine. [**Experience with** *Br. abortus*-**Chinosol Vaccine**].—*Berl. tierärztl. Wschr.* **50.** 469-470.

The author gives his experience of a vaccine, consisting of culture killed by the addition of chinosol, on four farms infected with contagious abortion. Although numerous abortions had occurred previously, there were no further cases after the use of the vaccine.—J. E.

SSILANOWA, I. W., & OSTROWSKAJA, O. A. (1934). Zur intrakutanen Titration des Oedematiensserums an Kaninchen. I. Mitteilung. [**Intracutaneous Titration of** *Clostridium oedematiens* **Serum in Rabbits**].—*Zlb. Bakt. I.* (*Orig.*). **131.** 485-487. 1 table.

An emulsion of dried toxin, if inoculated intradermally, produces inflammation and necrosis. The smallest amount capable of producing necrosis is taken as a standard (minimum necrotic dose – M.N.D.). Antiserum is tested against 10 M.N.D. of toxin, serum and toxin being mixed and inoculated intradermally into rabbits. The unit of antiserum is that amount just capable of neutralizing 10 M.N.D. of toxin.—E. J. PULLINGER.

I. BENGSTON, Ida A. (1934). **The Standardization of Gas Gangrene (Perfringens) Antitoxin.**—*Publ. Hlth. Rep. Wash.* **49.** 525-529. 4 tables. [2 refs.]

II. KLEIN, A. (1934). **The Proportion of Viable Cells in Broth Cultures of the Anaerobes. IV. Bacillus chauvei and Bacillus botulinus. V. Bacillus putrificus.**—*Acta brev. neerl. Physiol.* **4.** 24-26 and 26-28. 4 tables. [2 refs.] [In English].

I. The test dose of *Clostridium welchii* toxin is the amount of toxin which is capable of neutralizing one unit of standard antitoxin. The standard unit of antitoxin of the United States of America corresponds very closely to that of the Medical Research Council [England], and is to be adopted as the international standard.

To standardize a new antiserum, toxin is prepared, and the test dose is ascertained by inoculating varying amounts mixed with a unit of the standard antitoxin. The highest dose which fails to produce symptoms [i.e. is neutralized by the unit of antitoxin] is taken as the test dose. Pigeons weighing about 350 g. are used for this purpose. Varying quantities of the new antiserum are then inoculated with test doses of the toxin. The smallest quantity of the new antiserum which neutralizes the test dose is considered as containing one unit of antitoxin.

II. The viability of *Cl. chauvoei*, *Cl. botulinum* and *Cl. putrificum* has been examined [KLEIN, A. (1932). *Acta brev. neerl. Physiol.* **2.** 23, 72 and 74]. Intensive multiplication of the organisms occurred within 18 hours (*Cl. putrificum*), 29 hours (*Cl. chauvoei*), and 48 hours (*Cl. botulinum*). The shortest generation time for the first mentioned was 20 minutes, and for the others 10 and 21 minutes respectively. Intensive multiplication was accompanied by intensive dying off of bacilli.

—E. J. PULLINGER.

TEALE, F. H. (1934). **Experiments on the Portal of Entry of Bacteria and the Production of Intestinal Infection.**—*J. Path. Bact.* **39.** 391-407. 6 tables. [16 refs.]

The problem of the portal of entry and path of spread of intestinal infection has been investigated experimentally in laboratory animals, and it has been ascertained that the buccopharyngeal mucous membrane is permeable to infection without previous injury and that bacteria can pass *via* this entry to the regional

lymphatics, to the blood stream and then to the tissues, where they can be excreted through the entire length of the alimentary mucosa. The occurrence of intestinal infection, therefore, depends on the relative resistance of the alimentary mucosa. On the other hand, infection may be primarily enteral, when something has altered the permeability of the epithelium and glands of the intestine, and bacteria which have escaped the germicidal activity of the gastric juice invade the mucosa. The normal intestinal mucosa is an efficient barrier against bacterial invasion from the lumen of the gut. Furthermore, those bacteria which do not normally belong to the intestinal flora are inhibited from multiplication by the competitive action of the normal inhabitants.—R. LOVELL.

SCRIVNER, L. H., & LEE, A. M. (1934). **The Morphology, Culture, Isolation and Immunity Studies of Actinomyces necrophorus in Calf Diphtheria.**—*J. Amer. vet. med. Ass.* **85.** 360-378. 7 figs., 4 tables. [8 refs.]

The authors emphasize the difficulty of isolating *A. necrophorus* in pure culture and state that the published methods are not satisfactory. So heavy was the contamination in natural lesions that it was impossible to eliminate the contaminants by consecutive passage through as many as 15 rabbits. In only one out of 22 rabbits were internal lesions found and even in that case failure attended attempts to isolate *A. necrophorus*. After much effort a satisfactory method for isolating the organism was found, the details of which are given.

Four strains were isolated and studied. These always produced lesions in rabbits although the mortality was low. The virulence was found to be less than that of the mixed cultures obtained direct from natural lesions. When the four isolated strains were mixed they proved to be pathogenic for calves when injected into the submucous tissue of the tongue and lips or when applied to scarified areas.

Culture filtrates did not prove toxic to either rabbits or calves and had little immunizing power. A bacterin also failed to protect rabbits against artificial infection.—GWILYM O. DAVIES.

GROOTTEN, O. (1934). Caractères généraux et pouvoir pathogène expérimental de l'*Actinomyces israëli*. [**General Characteristics and Experimental Pathogenic Property of** *Actinomyces israëli*].—*Ann. Inst. Pasteur.* **53.** 311-323. 9 figs. [10 refs.]

The author describes three cases of human actinomycosis due to *A. israëli* [*A. bovis*], followed by a cultural study of the organism. He failed to infect guinea pigs experimentally but, by introducing small pieces of agar culture into the abdominal cavity, succeeded in infecting rabbits.

Regarding the classification, Grooten states that *Actinomyces* should be considered as bacteria and not one of the class *Hyphomycetes*. They are very closely related to the *Mycobacteria*.—GWILYM O. DAVIES.

GIBSON, Joan. (1934). **On the Nature of Clubs in Actinomycosis.**—*J. Path. Bact.* **39.** 533-535. 4 figs. on 1 plate. [13 refs.]

The author states that the clubs in actinomycosis are a developmental stage of the life cycle of the micro-organism, and are identical with the involution forms found in culture. They are the swollen terminations of small branches from the mycelium. Old clubs give rise to spherical involution forms by budding and these forms, becoming dispersed throughout the inflammatory exudate, give rise to further colonies.—GWILYM O. DAVIES.

BAUDET, E. A. R. F. (1934). L'actinomycose du Chien. [**Actinomycosis in the Dog**].—*Ann. Parasit. hum. comp.* **12.** 296-308. 6 figs. on 1 plate. [22 refs.]

The author describes in detail three cases of canine actinomycosis. The lesions were in the form of subcutaneous abscesses containing blood-stained pus in which there were numerous small granules, which at first sight resembled those found in bovine actinomycosis. They were, however, of a softer consistency and of a flaky nature. These granules contained Gram-positive long branching filaments and shorter forms resembling bacilli and cocci. Cultures yielded an organism which, microscopically, was indistinguishable from *Actinomyces bovis* Israel except that the pus grains did not show clubs. A complete account of the morphological and the cultural characters of the organism is given.

The causal organism, which the author has named *Cohnistreptothrix canis*, is placed in the genus *Cohnistreptothrix* proposed by PINOY (1911), in which genus the author also includes *C. israeli* (*Actinomyces bovis* Israel). He considers that the name *Streptothrix* should be avoided as this name was given to a completely different group of moulds by CORDA in 1839. [The author apparently reserves the name *Actinomyces bovis* to the organism described by BOSTROM in 1891].

—GWILYM O. DAVIES.

COLLET, P. (1934). Sporotrichose gommeuse disséminée chez un jeune chien. [**Sporotrichosis in a Young Dog**].—*Bull. Soc. Sci. vét. Lyon.* **37.** 72-82. 1 fig.

DE AREA LEAO, A. E., DA SILVA, J. O., & PROENÇA, M. (1934). Sur un cas de sporotrichose à *Sporotrichum Beurmanni* observé pour la première fois chez un mulet à Rio de Janeiro. [**Case of Sporotrichosis caused by** *S. beurmanni*, **Reported for the First Time in a Mule at Rio de Janeiro**].—*C. R. Soc. Biol. Paris.* **116.** 1157-1158.

Collet describes a case of sporotrichosis in a two-month-old spaniel as being a very rare condition in the dog. There were numerous discrete painless subcutaneous nodules varying from the size of a pea to that of a nut scattered over the body, but most noticeable on the neck. Many of the lesions had ulcerated, discharging offensive purulent material ; others were covered with brownish crusts. In the depth of the muscles other lesions could be palpated, but the lymphatic glands were not involved.

The second paper records the first case of sporotrichosis observed in a mule in South America. The lesions were similar in size and appearance to those described in the dog, but were located chiefly on the prepuce, scrotum, and the internal and external aspects of the left thigh. The lymphatics were corded and the glands swollen.

In both the dog and the mule the diagnosis was made by microscopic examination of stained films and by isolating the organism in culture. In both instances, also, complete recovery followed potassium iodide medication, which in human beings is regarded as specific.—GWILYM O. DAVIES.

LEBASQUE, J. (1934). Recherches morphologiques et biologiques sur les *Trichophyton* mégasporés du cheval et du boeuf. [**The Megaspore Trichophytons of Horses and Cattle**].—*Ann. Parasit. hum. comp.* **12.** 418-444. 3 text figs., 17 figs. on 2 plates. [13 refs.]

This is a study of the large-spored ringworm species of horses and cattle.

First of all a detailed description is given of the following three new species :—*Trich. bullosum* Lebasque, 1933, an equine parasite encountered in Tunis, Sudan and Syria ; *Trich. villosum* Lebasque, 1933, a bovine parasite in Tonquin and

Annam, and *Trich. papillosum* Lebasque, 1933, a bovine parasite in Syria and Morocco.

This is followed by a detailed description of certain new mycological features of previously known species. As a result of this study, the author has been able to demonstrate that, by cultivating the various strains on natural media (cereal grains and faeces), the hitherto presumed distinction between the species of the genus *Trichophyton*, which rests on the production of glabrous colonies by some and of downy colonies by others, no longer exists. On favourable media, faviform species produce an aerial mycelium and, conversely, on unsuitable media the downy types produce smooth colonies.

Finally he states that, in so far as the cattle parasites are concerned, the sporadic occurrence of the disease is due to the fact that the ringworm parasites probably lead a saprophytic existence on grain and faeces in humid and badly ventilated cowsheds.—GWYLIM O. DAVIES.

DISEASES CAUSED BY PROTOZOAN PARASITES.

YAKIMOFF, W. L., GOUSSEFF, W. E., NEZWETAIEFF, N. W., & RASTÉGAIEFF, E. E. (1934). L'infection et la maladie des zébus provoquées par les piroplasmidés. [**Piroplasmosis in Zebu Cattle**].—*Ann. Soc. belge Méd. trop.* **14.** 235-254. 1 table. [2 refs.]

The authors found zebu cattle infested with ten species of ticks, including four species which are known to be carriers of Piroplasmidae. They also measured the thickness of zebu skin and found it to be about the same as that of a Shorthorn. They consider that this disproves the belief that zebu are relatively resistant to ticks.

Either by direct smears, or after flaring up a latent infection by bleeding, or by subinoculation into calves, the authors were able to demonstrate the existence of *Gonderia mutans*, *Babesia bigemina*, *Anaplasma* sp., *Francaiella colchica* and *Trypanosoma theileri* in zebu cattle. A zebu calf inoculated with *Theileria annulata* died and Koch's bodies were shown in the lymph glands, etc. A zebu cow resisted this inoculation and it is supposed that the cow was immune owing to a previous infection.

A zebu calf inoculated with the blood of an adult zebu passed " redwater " and smears showed *G. mutans*, *B. bigemina* and anaplasmata. Another zebu calf was successfully infected with *B. bigemina* and *G. mutans* by means of *Ixodes ricinus* after a normal incubation period of 11 days. *Babesia bovis* was also noted in this calf. *B. bovis* was successfully re-inoculated into two other zebu calves. Similarly a zebu hybrid calf was successfully infected by means of *I. ricinus* with *B. bigemina* and *B. bovis*. Nevertheless the authors noted that the anaplasmosis set up in zebu calves was mild. This may be due to the strain of organism and not to the zebu calves possessing a natural resistance.—HARVEY S. PURCHASE.

JONES, E. E. (1934). **The Effect of Diet on the Course of Experimental Coccidiosis Infection in the Chicken.**—*J. Amer. vet. med. Ass.* **85.** 193-206. 10 tables. [3 refs.]

Young chickens kept on diets of different protein and vitamin A contents were artificially infected with *Eimeria tenella*. The results showed that the vitamin A content did not in any way alter the course or type of infection, but the weights of chickens on high protein diet remained nearest to those of the controls. The oocyst production was greatest in the birds receiving a high vitamin A content.

A greater tendency to chronicity or, in other words, a slower development of immunity, was noted in birds fed on a high vitamin A diet.—HARVEY S. PURCHASE.

I. VAUCEL. (1933). Les acquisitions nouvelles dans l'étude des trypanosomiases. **[New Facts in the Study of Trypanosomiasis].**—*Ann. Méd. Pharm. colon.* **31.** 25-63.

II. DAUZATS, A. (1934). Isolement du virus pestique (Peste bovine) d'une souche polluée de trypanosomes. **[Isolation of Rinderpest Virus from a Sample Contaminated with Trypanosomes].**—*Rev. vét., Toulouse.* **86.** 322-326.

I. The author gives a good review of recent investigations on trypanosomes in general and *T. gambiense*, *T. rhodesiense* and *T. brucei* in particular. From his own experience the author favours " moranyl " with " tryparsamide " or with " 270 Fourneau " for the treatment of cases of blood trypanosomiasis of man, whilst " tryparsamide " alone gave good results in cases affecting the central nervous system.

II. In the French Cameroons, where the infective blood from cases of rinderpest contains trypanosomes, it has been found possible to obtain pure rinderpest virus by using " l'émétique d'aniline ". This drug should be given intravenously immediately after inoculation of blood suspected of containing trypanosomes. It is advisable to reduce the amount of " contaminants " in the virus by reducing the amount of inoculum.—HARVEY S. PURCHASE.

DISEASES CAUSED BY VIRUSES.

ROBLES, M. M., & GENEROSO, J. D. (1934). **Dried Rinderpest Vaccine.**—*Philipp. J. Anim. Indust.* **4.** 33-43. 4 figs., 2 plates, 8 tables. [6 refs.] [Paper presented to the 16th Ann. Meet. Philippine Vet. Med. Ass.]

This vaccine was considered in detail in two previous reports by the same authors [*Philipp. J. Agric.* **1.** 367 and **2.** 341]. The present paper is a concise account of results obtained under laboratory tests and in an extensive field trial. The vaccine was found to be safe in use and of high protective value. Full immunizing power was retained up to 27 months of storage in an ice-chest or 30 days of exposure to ordinary room temperature.—C. DAVENPORT.

BENNETT, S. C. J. (1934). **" Immune " and " Hyperimmune " Cattle Plague Antiserum.**—*J. comp. Path.* **47.** 163-180. 3 tables. [13 refs.]

The theoretical arguments in favour of preparing antisera from naturally infected animals that had recovered or from controlled infected animals, are that these animals, whilst reacting to the disease, have within them a maximum and sufficient amount of virus to evoke the maximum amount of antibodies possible. On the other hand, hyperimmunized animals can never have offered to them as much antigen (virus) as is present during a natural or not over-controlled reaction. The author goes on to show that these arguments are not sound as the amount of antibodies evoked has not been proved to depend absolutely upon the amount of virus present.

He has found experimentally that naturally infected animals always give a serum of the highest potency, whilst animals which have had a controlled infection give sera of extreme variability, whatever criterion of sufficient reaction be adopted. Hyperimmune serum, on the other hand, always has an adequate potency and is the most convenient form to produce. He shows experimentally that the high

potency of hyperimmune sera is not dependent upon the initial titre.

—HARVEY S. PURCHASE.

FUKUSHIMA, T. (1934). **Pathological Studies of Rinderpest. Report I. The Histological Changes in the Liver.**—*J. Jap. Soc. vet. Sci.* **13.** 118-138. 9 figs. on 5 plates, 2 tables. [8 refs.] [In Japanese: abst. from English summary].

Seventy-nine cases were dealt with: except in one case in which pin-head haemorrhages were present, no gross lesions of the liver were noted. The usual changes were "vacuolar degeneration" and necrosis of the liver cells with focal haemorrhages. "Miliary nodules" composed of small mononuclear cells, often in dead Kupffer cells with or without collections of large cells with irregular nuclei, were the constant findings.—HARVEY S. PURCHASE.

—. (1934). Simultanimpfung gegen Schweinepest: Einrichtung und Durchführung. [**Austria: Regulations for Carrying Out Simultaneous Inoculation against Swine Fever**].—*Wien. tierärztl. Mschr.* **21.** 253-256.

These are *interim* regulations passed by the Ministry of Agriculture and Forestry in March 1934 for the carrying out of simultaneous inoculation of pigs for swine fever. The operation may only be performed in strict accordance with instructions which accompany the regulations. The district veterinary officer must be employed, and the virus and serum must be obtained exclusively from the Bundesanstalt für Tierseuchenbekämpfung, Mödling. Permission of the authorities must first be obtained. The instructions include a table of doses of serum and virus graduated to the weight of the animals.—F. BULLOCK.

I. SHOPE, R. E. (1934). **The Infection of Ferrets with Swine Influenza Virus.** —*J. exp. Med.* **60.** 49-61. 1 plate, 1 table. [6 refs.]

II. —. (1934). **The Aetiology of Influenza.**—*Lancet.* **227.** 149-150. [2 refs.]

I. This paper confirms the work of SMITH, ANDREWES and LAIDLAW [this *Bull.* **4.** 357.] on the transmission of swine influenza virus to the ferret. The animals were infected by the intranasal instillation of lung tissue under ether anaesthesia. Four different samples from two field outbreaks were used to initiate the experimental disease and the condition was transmitted in series, in one instance to the 16th passage. Portions of infected ferret lung stored in 50 per cent. of glycerin retained their virulence for 75 days.

The disease runs a regular course in the ferret. After an incubation period of from 24 to 48 hours, there is a sharp rise in temperature accompanied by loss of appetite and marked depression. The temperature then drops rapidly, but a second exacerbation occurs on the third day when catarrhal symptoms are seen. Evidence of respiratory distress subsequently appears, becoming very intense on the fourth or fifth day. A proportion of infected animals die between the fifth and eighth days, but some make a complete recovery. The disease was more severe than that produced by the British workers: this is ascribed to the preliminary anaesthetization of the animals and not to the use of lung tissue in place of turbinate bone emulsion as a source of virus.

In addition to the changes in the nasal chambers, the ferrets showed extensive lesions throughout the respiratory tract. The trachea and bronchi contained an abundant mucous exudate while the lungs presented a wide-spread lobar pneumonia. The histopathology simulated the changes seen in the pig.

In view of the close relationship of *Haemophilus influenzae suis* and the virus of swine influenza, a bacteriological study was made of the respiratory tracts of

sick ferrets, but this organism was not found – in fact, *H. influenzae suis* present in original pig material disappeared from the ferret after the first passage.

Positive results were also obtained with Berkefeld N filtrates. The inoculation of pigs with the ferret passage virus added to cultures of *H. influenzae suis* induced typical swine influenza.

Serum from recovered pigs neutralized ferret virus for either swine or ferrets ; conversely, serum from recovered ferrets neutralized natural swine influenza virus.

II. Annotation on above with special reference to the investigations mentioned and to the work of EICHHORN and PYLE [below] on the relationship of influenza to dog distemper.—R. E. GLOVER.

EICHHORN, A., & PYLE, N. J. (1934). **Observations on the Relationship of the Virus of Human Influenza and Dog Distemper. Preliminary Report.**—*J. Amer. med. Ass.* **102.** 2082-2083. 1 table. [1 ref.]

Ferrets were infected with influenza virus (obtained from SMITH, ANDREWES and LAIDLAW) by the method of nasal instillation. Batches of ferrets which had recovered from this virus were then tested with distemper virus. The results showed that the usual incubation period of from nine to ten days in normal animals was increased to from 13 to 17 days. In the first series, two out of seven were immune to distemper, while in a second series immunized by one, two or three instillations of influenza virus, four ferrets out of 11 were completely protected.

—R. E. GLOVER.

KÖVES, J., & HIRT, G. (1934). Ueber die Aujeszkysche Krankheit der Schweine. [**Aujeszky's Disease in Swine**].—*Arch. wiss. prakt. Tierheilk.* **68.** 1-23. 4 figs., 5 charts. [10 refs.]

A disease is described which occurs in swine, particularly after swine fever inoculation. Pigs are highly susceptible, a large proportion of herds being affected, though the mortality in outbreaks is seldom above 5 per cent. The condition is thought to be identical with Aujeszky's disease. It is caused by a filtrable virus which attacks the central nervous system and causes paralysis, but frequently the onset of infection is so acute that it appears as a febrile reaction without brain symptoms.

Clinically, pigs show high fever, inappetence, vomition, and diarrhoea ; up to 10 per cent. of cases show brain symptoms which include pharyngeal paralysis. This latter is characterized by excessive salivation and frothing, following slight chewing. *Post mortem*, pulmonary oedema, congestion of the vessels of the intestinal wall, general blood stasis, and inflammation of the pharynx and larynx are seen. Pneumonia follows as a secondary complication. Encephalitis may be demonstrated.

The virus which is found in the brain, blood and parenchymatous organs, and in the urine, saliva, and bronchial secretions is highly resistant to the action of phenol, since filtrates remain virulent when in the presence of 0·5 per cent. of phenol for 32 days. In artificial infection experiments the incubation period is three to five days.

There is immunity after recovery from infection, whilst the mortality rate can be lowered during an outbreak by the administration of serum collected from convalescent cases.

Other animals are liable to the disease, including dogs, cats, cattle, horses and sheep. In the case of sheep a very acute form of infection is encountered. No instance of the condition attacking a human being has been recorded.

—E. J. PULLINGER.

NICOLAU, S., & KOPCIOWSKA, L. (1934). Etude sur la Morphogénèse des Corps de Negri. [**Morphogenesis of Negri Bodies**].—*Ann. Inst. Pasteur.* **53.** 418-437. 22 figs. on 1 plate. [14 refs.]

The authors have succeeded, after passage experiments carried out over a period of nearly two years, in changing the fixed virus into the street virus by inoculating rabbits. The rabbits used in the experiments received inoculations with virus into the right sciatic nerve, material for further inoculation being taken from the left nerve.

The formation of Negri bodies was traced from the Nissl granules in lumbar nerve ganglia. These granules first flocculate and their staining characteristics change gradually until finally, after concentration, they become the typical Negri bodies.

The authors further postulate that the Negri bodies are the result of the resistance set up by the cell against the virus and are most profuse in those nerve cells with most Nissl granules. Thus, when a virus becomes acutely active against the brain cells these cells have little chance to "gain their victory against the virus." This cellular victory is manifested by Negri bodies.

—HARVEY S. PURCHASE.

SLAGSVOLD, L. (1933). Vaksinasjon mot hvalpesyke. [**Vaccination against Dog Distemper**].—*Norsk VetTidsskr.* **45.** 554-566.

The author gives his experience with the Laidlaw-Dunkin vaccine against dog distemper in 180 dogs. The results were satisfactory; only two of the dogs developed distemper and, in these cases, the disease developed a few months after vaccination. Dogs evidently carry infection for some weeks after vaccination, as susceptible puppies placed in contact became infected. Dogs, therefore, ought to be isolated for about one month after vaccination.—L. SLAGSVOLD (OSLO).

I. MORRIS, M. L. (1934). **Further Studies in the Control and Hospitalization of Canine Distemper.**—*J. Amer. vet. med. Ass.* **85.** 39-63. 9 tables. [13 refs.]

II. MORRIS, M. L. (1934). **Clinical and Laboratory Studies of the Simultaneous Use of Serum Concentrate (Little) and Living Virus for Immunizing Dogs against Distemper.**—*N. Amer. Vet.* **15.** No. 8. 32-37. 6 tables. [5 refs.]

I. This paper records a detailed study of dog distemper with special reference to the blood picture, which the author appears to have used as the chief guide to prognosis. Four clinical types of distemper are described. Distemper serum and vaccine and "nucleotide" were principally used in special treatment.

II. The protective power of "serum concentrate", a distemper immune serum, against the pathogenic action of desiccated virus and fresh liquid virus was tested on dogs under experimental conditions, virus and serum being injected simultaneously. The dogs remained well and also resisted repeated doses of virus given 30 or more days later. The blood counts of the experimental dogs are given. The above simultaneous method of immunization was applied to a large number of dogs of many breeds and, according to the replies to a questionnaire, all dogs did well.—J. E.

I. BOLLE, W. (1934). Makroskopische Herzebefund bei Einhufern mit infektiöser Anämie. [**Macroscopical Heart Lesions in Solipeds Affected with Equine Infectious Anaemia**].—*Arch. wiss. prakt. Tierheilk.* **68.** 42-49. 6 figs. [2 refs.]

II. OPPERMANN, T. (1934). Untersuchungen über die ansteckende Blutarmut der Pferde. [**Research on Equine Infectious Anaemia**].—*Dtsch. tierärztl. Wschr.* **42.** 495-496. [7 refs.] [English summary: abst. from orig.]

III. EILMANN, H. (1934). Zur pathologischen Anatomie und Histologie der ansteckenden Blutarmut und deren Rolle bei der Mischinfektion mit Tuberkulose und Druse der Pferde. [**Pathology of Equine Infectious Anaemia and its Role in Mixed Infection with Tuberculosis and Strangles** – *Streptococcus equi* **Infection**].—*Ibid.* 506-508. [12 refs.]

I. The author has examined 120 horses and 10 mules of both sexes and varying ages, and has found the following changes.

There was hypertrophy or dilatation of the heart in 41·5 per cent. of cases. In 8·4 per cent. of cases the epicardium showed changes including sub-epicardial haemorrhages or a chronic fibrous epicarditis. The heart fat showed serous degeneration. In 48 per cent. of cases the myocardium was altered as regards colour, consistence, moisture content, the presence of haemorrhage and the excessive formation of fibrous tissue. In 58 per cent. of cases there were sub-endocardial haemorrhages or chronic inflammation. The valves were altered in 11·8 per cent. of cases. In 31 per cent. there were vascular changes including thickening of the intima of the large blood vessels.

II. The properties of the filtrable virus are noted. The most reliable method of diagnosis is that of animal inoculation ; rabbits have largely been used for this work, but experiments with the fowl and the pigeon are giving promising results. The corrosive sublimate test is also available for diagnosis. Prophylaxis by the use of spleen extract vaccines is a subject that deserves further study.

III. The usual macroscopic and microscopic changes encountered in more than 80 cases of infectious anaemia are described. These correspond fairly closely with classical descriptions. Information has also been collected from cases of the disease amongst a further group of 600 horses. Characteristic changes include erythrophagocytosis and accumulation of iron (i.e. haemosiderin) in reticulo-endothelial cells. Certain changes, such as oedema and inflammation of the alimentary tract, are really secondary to cardiac disorder. Amongst 33 cases of equine tuberculosis, 20 were also suffering from infectious anaemia. In such cases calcification of the cardio-vascular tissue was to be found. A mixed infection with strangles was also noted.—E. J. PULLINGER.

BALOZET, L., & AOUSTIN, L. (1934). Premier cas d'anémie infectieuse des équidés observé en Tunisie. [**First Case of Equine Infectious Anaemia in Tunis**].—*Bull. Soc. Path. exot.* **27.** 639-641.

The authors describe in detail a case of equine infectious anaemia. This disease has not previously been reported in Tunis. The subject was an artillery horse which had been in the country three years. The conclusion arrived at is that the horse must have become infected in France before being purchased.

—C. DAVENPORT.

FAURE, L. (1934). Dépistage de l'anémie infectieuse des Equidés par la Sédimentation. [**Diagnosis of Equine Infectious Anaemia by Blood Cell Sedimentation**].—*Bull. Acad. vét. Fr.* **7.** 317-329. 2 tables. [8 refs.] [Reprinted *verbatim* in *Rev. vét. milit.* **18.** 337-354].

The author considers that blood cell sedimentation is a test of real value in the diagnosis of equine infectious anaemia. The first part of the paper is devoted to a study of the various indications provided by the test and their significance. Chief among these are the fall in the volumetric index and the increased rapidity of deposition of corpuscles shown at certain stages of the disease. A single test is insufficient for diagnostic purposes. Diagnosis is based upon the results of tests

repeated at regular intervals, considered in conjunction with the information obtained from the clinical examination of the animal.

The second part of the paper is an account of the incidence of the disease in certain military units and its elimination from a regiment of cavalry by the above method.—C. Davenport.

Alexander, R. A., & du Toit, P. J. (1934). **The Immunization of Horses and Mules against Horsesickness by Means of the Neurotropic Virus of Mice and Guinea-Pigs.**—*Onderstepoort J. vet. Sci.* **2.** 375-391. 10 tables. [3 refs.]

The authors were able to show that, by intracerebral serial passage through white mice and guinea pigs, horse-sickness virus shows a gradual loss of virulence for the horse, but that the antigenic properties are not lost in the change from viscerotropism to neurotropism. Using this attenuated neurotropic virus as a basis, a method of immunization for horses and mules was devised. The possibility of producing a polyvalent vaccine embodying several strains of horse-sickness virus is suggested. This has been done with a single injection containing two types of virus. Attenuation of horse-sickness virus occurs more rapidly through the guinea pig, but mouse brain contains proportionately much more virus. It was found that immunity in the horse to one strain of virus after inoculation with mouse brain gave only a partial immunity against other strains : hence the necessity for a polyvalent vaccine. No difference in favour of either the subcutaneous or intravenous method of inoculation could be found.—E. M. Robinson.

I. Bekker, J. G., de Kock, G. v. d. W., & Quinlan, J. B. (1934). **The Occurrence and Identification of Bluetongue in Cattle – the so-called Pseudo-Foot and Mouth Disease in South Africa.**—*Onderstepoort J. vet. Sci.* **2.** 393-507. 33 figs., 3 tables, 3 appendices. [16 refs.]

II. Nieschulz, O., Bedford, G. A. H., & du Toit, R. M. (1934). **Investigations into the Transmission of Bluetongue in Sheep during the Season 1931/1932.**—*Ibid.* 509-562.

I. In this article the first recorded cases of natural blue tongue in cattle are described. The campaign against foot and mouth disease in South Africa in 1932 to 1933 brought numerous cases to light of a stomatitis in cattle which appeared to be wide-spread. Transmission and cross-immunity experiments showed that this condition was really blue tongue. The seasonal occurrence of the disease corresponded to that of blue tongue and horse-sickness. An attempt to transmit the condition to white mice by intracerebral inoculation was unsuccessful. The symptoms noticed in cattle were a marked febrile reaction, stiffness and lameness and hyperaemia of the buccal mucous membrane with necrosis most marked on the lips, gums, tongue and muzzle. Deep-seated necrotic ulcers of the tongue were seen in some cases. Marked mucoid or mucopurulent discharge from the nose was seen in most cases and, in some, protrusion of the tongue with marked salivation. Lesions of the teats resulting in scab formation were seen in cows. Marked skin lesions were noted in some cases with reddening, exudation and scab formation. Excoriation of the interdigital space in the feet was noticed in several cases and, in one, separation of the skin and claws at the coronets in all four feet.

II. This article records the authors' attempts to transmit blue tongue of sheep by means of mosquitoes. Only species of *Aëdes* were used as they were considered to be the mosquitoes most likely to transmit the infection. The technique for keeping the mosquitoes alive and for producing suitable humid conditions during the attempts at transmission are described. Six different species of mosquitoes were used, viz. *Aedes caballus*, *A. dentatus*, *A. hirsutus*, *A. lineatopennis*,

A. punctothoracis and *A. vittatus*. Three positive transmissions occurred with the inoculation of crushed mosquitoes of different species which had fed on sheep with blue tongue. In one case a reaction occurred with mosquitoes (*A. lineatopennis*) which had fed 17 to 19 days before. The authors state that the work carried out to date does not present a solution of the problem of the natural transmission of blue tongue.—E. M. Robinson.

Nowak, & Lominski, I. (1934). Morphologie et évolution du microbe de l'Agalaxie Contagieuse des Ovins et des Caprins dans les milieux nutritifs. **[Structure and Development of the Organism of Contagious Agalactia].**—*Ann. Inst. Pasteur.* **53.** 438-451. 62 figs. on 1 plate. [9 refs.]

The authors have prepared a series of photomicrographs from liquid cultures of the contagious agalactia virus. As is the case with the pleuro-pneumonia virus, the starting point in the life cycle is a minute body (elementary corpuscle) surrounded by a matrix which is less intensely coloured than the central granule. This matrix is probably responsible for the pleomorphism of the organism in the latter stages of its development. During multiplication, structures resembling gonidia are formed. They are of two types ; one assumes the form of a ring-like unstainable corpuscle while the other is an intensely-stained smaller granule. The gonidia reproduce by budding.

The most common form in older cultures is an irregular mass of feebly staining material without visible structure which, it is suggested, has a semi-liquid consistency. It is thought that these highly plastic forms are sufficiently small to pass a bacterial candle and thus represent the filtrable phase of the organism.

The developing gonidia never give rise to branched mycelial forms which are so common in cultures of pleuro-pneumonia. This characteristic clearly differentiates the two organisms.—R. E. Glover.

Gilbert, S. J., & Simmins, G. B. (1934). **Further Observations on Cell Inclusion Disease of Fowls, and Differential Diagnosis from Fowl Plague.**—*J. comp. Path.* **47.** 201-204. 1 table. [3 refs.]

This disease is considered to be a separate identity and should be differentiated from fowl plague. Among the more important differences are :– (a) the leucocytic inclusion bodies present in this disease ; (b) instability of the virus preserved in glycerin saline [conditions of storage are not given] ; (c) the occurrence of acute and chronic forms of the disease ; (d) the variable mortality in the different outbreaks studied, and (e) the frequent presence of yellow lesions in the liver.

—Harvey S. Purchase.

Beaudette, F. R., Hudson, C. B., & Saxe, A. H. (1934). **An Outbreak of Fowl Plague in New Jersey in 1929.**—*J. agric. Res.* **49.** 83-92. 2 tables. [12 refs.]

This article records the occurrence of an outbreak of fowl plague in a small flock of chickens, infection spreading to two other flocks in the vicinity. Material from affected birds produced typical plague on inoculation into experimental animals. *Post-mortem* examination showed oedema of the head parts, severe haemorrhagic tracheitis and peritracheal oedema, haemorrhage on the heart and pleura and under the cuticle of the gizzard.

The virus could be filtered through a Mandler candle, but not through a Seitz disc. In two experimental birds recoveries were observed and in both cases large vesicles developed on the comb and wattles. Virus inoculated intravenously into an immune bird could not be detected in the blood stream four hours later. Blood

serum from an immune bird neutralized virus *in vitro*. Carriers do not appear to occur and the virus could not be detected in recovered birds. Active immunity could not be produced by injections of phenol-glycerin liver emulsion. Attempts at mosquito transmission yielded negative results.—R. F. GORDON.

MEYER, K. F., & EDDIE, B. (1934). Eine Psittakoseepidemie in einem Vogelbauer mit Reisvögeln und Sittichen. [**An Outbreak of Psittacosis in an Aviary Containing Java Sparrows and Parakeets**].—*Berl. tierärztl. Wschr.* **50.** 577-580. [8 refs.]

An outbreak of psittacosis occurred in an aviary and Java sparrows became infected from contact with parakeets. In the course of investigation it was found that the disease can exist in latent form in Java sparrows, as well as in many other species besides parakeets. This is of great importance from the epidemiological standpoint. Java sparrows, when inoculated with virus either from parakeets or from Java sparrows, developed infection after an average incubation period of 11 days. After simple contact the incubation period was longer, but it is interesting to note that whilst Java sparrows inoculated with parakeet virus developed infection, others in simple contact with this strain remained healthy.—E. J. PULLINGER.

GREENE, H. S. N. (1934). **Rabbit Pox. I. Clinical Manifestations and Course of Disease. II. Pathology of the Epidemic Disease.**—*J. exp. Med.* **60.** 427-440 and 441-455. 36 figs. on 6 plates. [2 refs.]

I. A highly contagious and fatal disease occurred in a large stock of rabbits in 1932. A small but similar epidemic also occurred in 1930. The incubation period was five to seven days. The symptoms varied with the situation of the pock-like lesions. Lesions were frequently present on the skin, the ears especially, in the mouth and on the tongue. The eyes were also often affected. Lactating does and pregnant does were the most severely affected. No carriers of the disease remained after recovery.

II. Lesions were also found internally in the liver, spleen, lungs and genitalia. They were in the form of small nodules which, when externally situated, were often umbilicated. No truly pustular stage was noted. Internally, the lesions consisted of areas of necrosis up to a centimetre in diameter. Diffuse lesions and infiltrations often led to pneumonia and inflammatory changes in other organs. Microscopically, the bone marrow showed extensive wide-spread necrosis of the haematopoietic tissue. The infection originated in the Institute, spreading in an atypical form until it reached the breeding colony as an epidemic.—HARVEY S. PURCHASE.

GLASER, R. W., & LECAILLADE, C. W., Jr. (1934). **Relation of the Virus and the Inclusion Bodies of Silkworm " Jaundice ".**—*Amer. J. Hyg.* **20.** 454-464. 5 tables. [9 refs.]

The authors regard the polyhedra associated with silkworm disease as nucleoproteins resulting from a disturbance in metabolism. They are of diagnostic value but of no aetiological importance.

In previous experiments they demonstrated that the supernatant fluid from freshly drawn centrifuged infective blood set up the disease. They now show that a similar fraction from stored blood was non-infective although the polyhedra in the sediment were fully virulent. The virus could be liberated from the polyhedra by continuous washing, a phenomenon suggesting adhesion of the infective agent to the inclusion bodies, but the latter could not be entirely freed from virus in this manner.—R. E. GLOVER.

WHITEHEAD, R. (1934). **The Cortical Lipoid of the Suprarenal in Mice (1) with Infectious Ectromelia, (2) in Starvation, (3) Exposed to Heat, and (4) Fed on Cholesterol.**—*Brit. J. exp. Path.* **15.** 279-286. 2 tables. [16 refs.]

A method is described for the estimation of the proportion of suprarenal cortex occupied by lipoid. This involves the weighing of drawings prepared from the image of frozen sections stained with " Sudan III ". The calculation gives the ratio of the area of lipoidal-laden cortex to the area of normal cortex.

It was found that a significant decrease occurred in the later stages of ectromelia infection and in mice starved for two days at 18°C. Normal amounts were found in starved mice kept at 37°C. and in animals fed with powdered cholesterol.

—R. E. GLOVER.

INVERTEBRATE VECTORS OF DISEASE.

BEDFORD, G. A. H. (1934). **South African Ticks. Part I.**—*Onderstepoort J. vet. Sci.* **2.** 49-99. 53 figs. [29 refs.]

In this article the author deals mainly with the species of Argasidae. It is the first of a series of about four articles dealing with South African ticks and the whole series will ultimately be published in book form. The genus *Ornithodorus* has been dropped and reasons for doing this are put forward. Mention is made of the successful transmission, by COLES and the author, of *Aegyptianella pullorum* by *Argas persicus*. A key to the genera of the Ixodidae is given in the latter part of the article.—E. M. ROBINSON.

WHITNALL, A. B. M. (1934). **The Trypanosome Infections of *Glossina pallidipes* in the Umfolosi Game Reserve, Zululand. (Final Report).**—*Onderstepoort J. vet. Sci.* **2.** 7-21. 1 fig., 4 tables. [4 refs.]

This paper is a continuation of the author's previous (1932) report [this *Bull.* **3.** 709]. *Tryp. vivax* appeared to be the most common trypanosome found in infected flies, followed by *T. congolense* and *T. brucei*. Mixed infections occurred. The type of infection varied with the locality. The role played by *Stomoxys* as a transmitter of nagana [*T. brucei* infection] is discussed and it is concluded that mechanical transmission by this fly is possible, provided that it is present in large numbers and that the infected animals show a heavy inrection of the blood. The infected and susceptible animals must be in close contact.—E. M. ROBINSON.

HARRIS, R. H. T. P., & WHITNALL, A. B. M. (1934). **The Vegetable Diet Theory of *Glossina pallidipes*.**—*Onderstepoort J. vet. Sci.* **2.** 101-111. 8 tables.

The experiments described in this article were undertaken as a result of a paper read before the Durban branch of the Royal Society of Tropical Medicine and Hygiene, in which it was suggested that *Glossina pallidipes* can live on the latex of certain plants. As a result of their work, the authors concluded that the tsetse fly is incapable of piercing the plant tissues and, if fed on latex, soon dies without reproduction taking place. The latex appears to have a toxic effect on the tsetse fly.

—E. M. ROBINSON.

DISEASES CAUSED BY METAZOAN PARASITES.

KNIPLING, E. F. (1934). **Observations on First-Stage Larvae of *Gastrophilus intestinalis* in Tongues of Horses in Central Iowa during December, 1932, and January, 1933.**—*J. Parasit.* **20.** 196-197. 1 table.

In Iowa, Knipling found 26 larvae in the tongue of each of eight horses examined between December 8th and 14th. After this date very few were found. If horses are to be treated with carbon bisulphide before January 15th, it is essential that all the eggs on the skin be destroyed, otherwise the viable eggs will produce a re-infestation. It appears likely that destruction of the eggs is not necessary if treatment is carried out at a later date.—A. W. N. PILLERS.

WEHR, E. E. (1933). **Observations on the Length of Time First-Stage Larvae of *Gastrophilus intestinalis* Remain in the Tongue of the Horse.**—*N. Amer. Vet.* **14.** No. 10. 35-41.

Wehr found as a result of experiments that the newly-hatched larvae of *Gastrophilus intestinalis* take more than 21 but probably not more than 28 days to reach the stomach from the mouth. Treatment can, therefore, be commenced about one month after the adult flies disappear, if all the eggs on the hairs are first destroyed. Certain other aspects not mentioned in the title receive attention, such as the disappearance of adult bot flies and a rational bot control campaign. —A. W. N. PILLERS.

ONO, S., & YAMASAKI, T. (1934). **On the Bionomics of the Warble Fly Observed in the Vicinity of Ohri, Inner Mongolia.**—*J. Jap. Soc. vet. Sci.* **13.** 213-223. 6 figs. on 2 plates, 3 tables. [4 refs.] [In Japanese: abst. from English summary].

The writers record that the warble larvae generally emerged from the tumours during the day, and thus chiefly while the cattle were at pasture. Eggs were laid mostly on the hairs of the dewlap and brisket, and from observations made on two calves it is supposed that the invasion of the larvae into the bodies of cattle takes place through the skin. Larvae were found around the trachea and oesophagus, and some in the pericardium. Oedema in the pleura and pericardium was attributed to the presence of the larvae.—J. S. STEWARD.

PETERS, H. (1933). Versuche zur Bekämpfung des Dasselbefalls beim Rinde. V. Beitrag. Fliegenabwehr, Immunisierung, Medikamentöse Abtötung der Dasseln mit SO_2 Präparaten, Delicia und wässrigen Derris-extrakten. **[Campaign against Ox Warble Flies. V. Fly Repellants, Immunization and SO_2 Preparations, "Delicia" and Derris as Larvicides].**—*Inaug. Diss. Hanover.* pp. 46. 18 tables. [16 refs.]

TRIALS WITH FLY REPELLANTS.—Five preparations were tested, but none of them was efficacious for more than about four hours.

IMMUNIZATION.—Older cattle which have been infested by warble larvae many times show a decrease in parasitism with age. Experiments were, therefore, carried out on unexposed calves to find out whether any immunity could be conferred by subcutaneous inoculations of warble larvae extract. Tests with single or double doses on several controlled groups of calves gave negative results, all animals showing a similar degree of infestation after the warble fly season.

LARVICIDES.—Four sulphur preparations, five "delicia" preparations and derris wash, were tested by application to the backs of infested cattle. The sulphur preparations were of little value; some of the "delicia" preparations were of slight value and derris wash was found to be very efficacious [see also this *Bull.* **4.** 738].—J. E.

CAMERON, T. W. M. (1934). **The Economic Importance of Parasitology.**—*Sci. Agric.* **14.** 540-546.

This paper gives a general account of the relationship of protozoan and metazoan parasites to animal husbandry in Canada. Parasitism is considered by the author to have become the most important pathological condition of horses, sheep and pigs, and, in poultry, as second only to bacillary white diarrhoea. The ox warble is thought to be the most important parasite of cattle. A note is given on the organization of the Institute of Parasitology at McGill University, Canada.
—E. L. TAYLOR.

I. VON SARNOWSKI. (1934). Ueber Bekämpfung der Wurmkrankheiten im Preuss. Gestüt Hunnesrück. [**Control of Helminthiasis at the Hunnesrück Stud (Prussia)**].—*Dtsch. tierärztl. Wschr.* **42.** 260-264. 4 tables.

II. LAGAILLARDE. (1934). Contribution à l'étude des helminthiases du Cheval. [**Equine Helminthiasis**].—*Bull. Acad. vét. Fr.* **7.** 190-194.

III. HORNUNG, J. (1934). Zusammenfassung von 7 nicht veröffentlichten Arbeiten über Wurmbefall und Wurmbekämpfung bei den Pferden. [**Summary of Seven Unpublished Works on Helminthiasis in the Horse**].—*Z. Veterinärk.* **46.** 241-254. [26 refs.]

I. von Sarnowski gives a description of the method of rearing weaned foals which are purchased at ages ranging from three to six months. Diseases due to worms are extremely important. Bacteriological investigation showed that the cause of death in most cases was infection with paratyphoid bacteria of the Breslau type, and in the remainder with *Bacterium pyosepticum viscosum* [*Bact. equirulis*]. Fresh cases were later given 100 c.c. of paratyphoid and *Bact. equirulis* serum, which, except in the peracute cases, gave very successful results. To combat the worms in the blood, salvarsan, copper solution, " sclerostomex," " antimosan," and tartar emetic solutions were used. In 1929, 13·9 per cent. of the 16·6 per cent. of disease was due to losses caused by worm infestation. The two most frequent species of worm were *Strongylus* and *Ascaris*, both of whose larvae journey through the body, where they carry bacteria and produce disease.

Four tables show the number of foals with ascarid and strongyle eggs in their faeces before and after the first, second and third treatments for worms. The eggs gradually became less and the number of foals without eggs rose very considerably. Arsenic preparations were used in the food, and it was often necessary to force the animals to eat by fasting. Tartar emetic, 5 g. per foal, was also used in food, but the results were no better. Carbon tetrachloride in capsules had a marked effect on strongyles. The author discusses general prophylactic measures.

II. Lagaillarde gives a report on 800 horses belonging to a Huzzar regiment from 1927 to 1932, and deals with the nematodes of the alimentary canal. The faeces of 200 animals were examined ; all contained strongyle eggs, 3 per cent. eggs of ascarids, and in 70 per cent. eggs of oxyurids were found on the perineum. A rough method of examining faeces is given. There are three forms of the disease.

In 1927, treatment for a light cavalry horse weighing 370 to 400 kg. consisted of the administration of essence of terebinthene 100 to 125 g., chloroform 20 to 25 g., and castor oil 300 g. A subcutaneous injection of pilocarpine or, preferably, arecoline is given soon after the drench to prevent absorption in the small intestine, and to hasten its arrival in the large bowel. In 1932 this treatment was altered to an electuary containing essence of terebinthene 100 g., chloroform 20 g., aloes 20 g., treacle and powdered liquorice q.s. [The author does not appear to have had any experience of the stomach tube and his doses are high according to English standards]. The animals were able to return to work in four days and gained an average of 30 kg. in weight in two months.

Worms cause a large number of cases of colic. They are contracted in the stable as well as elsewhere. The easiest and best method of prevention is to destroy the worm. When one horse is found to be infested, all the animals in the troop should be regarded as being in the same state. One treatment is not enough, two are necessary in the spring of consecutive years. The microscope will indicate the animals requiring treatment. When a horse enters a troop, two treatments are necessary at an interval of three months. This has a good effect on health, on the utilization of rations, on resistance to fatigue, and on the morbidity and mortality from colic.

III. In this paper Hornung summarizes the contents of seven apparently unpublished papers on equine helminthiases, viz :- (1) BUTZLAFF, " The Control of Intestinal Parasites of Horses with Tartar Emetic " ; (2) GOMOLKA, " Experiences with the Anthelmintic Sanostibin " ; (3) GOMOLKA, " Oxyuriasis of the Horse " ; (4) HORNUNG, " The Action of Arsenic Preparations on Worm-Infested Horses " ; (5) MESECKE, " The Examination of Horses' Faeces for Worm-Eggs " ; (6) NATUSCH, " A Contribution on the Use of Drugs in the Control of Sclerostomiasis " ; and (7) SCHICK, " A Further Contribution to the Question of the Diagnostic Value of Eosinophiles in the Blood-Picture of Worm-Infested Horses ". To this summary he adds a considerable amount of his own experience and appears to have embodied the views of a further 19 authors, references to whose work are given.

About 100 per cent. of troop horses are affected with intestinal strongyles, and 10 to 24 per cent. with ascaris. The author accepts the view that the females of *Oxyuris equi* enter the bowel wall and lay eggs there, which later hatch out in the same host. Diagnosis is made by faecal examination for eggs, by faecal culture for larvae, by blood examination and by allergic reactions.

There is a brief reference to the influence of age upon worm infestation. Sclerostomes and ascarids are common in animals from one to eight years old, and the former are associated with colic. The influence of season upon worm infestation is not clear.

As regards control, both on economic and hygienic grounds, it is necessary to organize against sclerostome and ascarid infestation. Disinfection of stabling and biothermic treatment of manure are important. SKRJABIN has proposed international control measures. A large number of anthelmintics are discussed and the difficulties of getting at larvae in situations other than the alimentary canal are considered.—A. W. N. PILLERS.

I. KRULL, W. H. (1933). **New Snail and Rabbit Hosts for** *Fasciola hepatica*. —*J. Parasit.* **20.** 49-52. [6 refs.]

II. SEMICHON, L. (1933). Sur le contenu des cellules vésiculeuses du parenchyme de *Fasciola hepatica* L. [**Contents of the Large Cells of the Parenchyma of** *Fasciola hepatica* L.].—*C. R. Soc. Biol. Paris.* **114.** 1169-1170. [1 ref.]

III. LIÈVRE, H. (1933). La cachéxie aqueuse algérienne. [**Distomatosis in Algeria**].—*Rev. vét., Toulouse.* **85.** 553-559.

IV. LIÈVRE, H. (1934). Résistance de la grande Douve du foie à quelques toxiques. [**Resistance of the Liver Fluke to Toxic Substances**].—*C. R. Soc. Biol. Paris.* **115.** 635-636.

I. As a result of laboratory experiments Krull was able to develop the intermediate stages of *F. hepatica* in the snail, *Fossaria modicella* Say, and to infect the cotton-tail rabbit, *Sylvilagus floridanus mallurus* (Thomas), with the adult worms. Attempts to infect the snails, *Succinea avara* Say, and *Lymnaea palustris* Müll, and an opossum, *Didelphys virginiana* Kerr, were not successful.

II. Semichon has observed that the large vesicular cells of the parenchyma of *F. hepatica* contain, along with glycogen, an amorphus substance, similar to that which is found in the vesicular cells of molluscs. After fixation this substance may be stained by blue-black ink.

III. *F. hepatica* is solely responsible for liver rot in Algeria, *Dicrocoelium lanceolatum* not having been found in the country. The disease is not uncommon in certain localities, in spite of the hot climate, the resistance of the suggested cercariae to heat and dryness doubtless accounting for the survival of the parasite. In general, infestations are low in sheep, but usually higher in cattle, this distribution being explained by the practice of placing the sheep on upland pastures and reserving the better grass in the valleys for the cattle.

IV. The action of various toxic substances has been observed *in vitro* on *F. hepatica* kept in glucose Ringer's solution at 37°C., a 1 per cent. solution of the substances being added to the medium. Arranged in the order of their toxicity for the liver fluke, the various substances tried were as follows :– thymol, phenol, pelletierin, gentian violet, quinine, extract of male fern, tartar emetic, methylene blue, emetine and " stovarsol ".—E. L. TAYLOR.

STEWART, W. L., & PIERCY, S. E. (1934). **Parasitic Gastro-Enteritis in Sheep.**—*Vet. Rec.* **14.** 1165-1169. 3 tables. [5 refs.]

One hundred hoggs severely parasitized by *Ostertagia circumcincta*, *Trichostrongylus extenuatus* and *Cooperia oncophora* were divided into four equal groups of 25 and subjected to treatment with a 1 per cent. solution of copper sulphate, powdered copper sulphate and tetrachlorethylene respectively, one control group remaining untreated. The process of recovery was followed by means of observations on the egg count, haemoglobin estimations and blood counts on representative sheep, and it was found that, although in course of time the untreated sheep recovered [this not infrequently happens in the chronic kind of parasitic gastritis which usually results from heavy trichostrongylus infestation], the recovery was much slower than in those treated with copper sulphate, either in powder form or in solution ; tetrachlorethylene appeared to have little effect. The blood of severely parasitized sheep was observed to be low in neutrophiles, but to have an increased lymphocyte count and a return to the normal proportions appeared to be the first indication of recovery.—E. L. TAYLOR.

I. ROBERTSON, D., & FRASER, A. H. H. (1933). **On the Incidence of Stomach Worms in Lambs in the North of Scotland and their Control by Progressive Sectional Grazing.**—*J. Helminth.* **11.** 187-194. 4 tables. [4 refs.]

II. DIKMANS, G., & ANDREWS, J. S. (1933). **A Note on the Life History of** *Ostertagia circumcincta.*—*J. Parasit.* **20.** 107. [155th Meeting of the Helminth. Soc. Washington].

III. DIKMANS, G., & ANDREWS, J. S. (1933). **A Note on the Time Survival of Larvae of** *Haemonchus contortus*, *Ostertagia circumcincta* **and** *Nematodirus spathiger*, **on Pastures.**—*Ibid.* 107.

IV. DE ALMEIDA, J. L. (1933). Note sur les espèces du genre *Haemonchus* Cobb, 1898 (*Nematoda-Trichostrongylidae*). [**Note on the Species of the Genus** *Haemonchus* **Cobb, 1898**].—*C. R. Soc. Biol. Paris.* **114.** 960-961. 1 fig.

I. A table of the number of worms recovered from two typical cases of parasitic gastritis in lambs in the north of Scotland shows 16,930 and 18,110 *Ostertagia circumcincta*, only 53 and 76 *Haemonchus contortus* respectively, and comparatively small numbers of other species. This is typical of parasitic gastritis in that part of the country. An experiment was carried out to ascertain the effect

of progressive sectional grazing upon the worm infestation. A three-acre field was divided into two equal parts, one of which was subdivided into ten equal subdivisions. The two test groups of sheep consisted of six ewes and their 12 lambs; those in the sub-divided portion of the field moved progressively from one part to the next at about ten-day intervals, never returning to any plot which they had once left behind; the others were allowed to range freely over the whole area. Subsequent *post-mortem* examination showed that the stationary group carried an average of 1,550 *H. contortus* and 865 *O. circumcincta* as compared with 258 *H. contortus* and 166 *O. circumcincta* in the group managed by progressive sectional grazing.

II. On examining the fourth stomachs of sheep which had grazed on infected pasture for three weeks, the larvae of *Ostertagia* were found in small, raised, white areas of the mucous membrane. Dark coloured spots at the pyloric end of the stomach were found to contain nearly mature specimens of *O. circumcincta* and it is thought that the early stages of this species live in the mucous membrane and do not emerge until almost adult.

III. The sheep mentioned in connection with the above observation were worm-free when placed on the pasture; at autopsy they were found to carry *H. contortus* and *Nematodirus spathiger* as well as *O. circumcincta*; as the pasture had been vacant throughout the winter it is shown that these parasites are able to survive on pasture throughout the winter months.

IV. On making a study of the genus *Haemonchus* the author finds that a number of the species which it contains are based upon the characters of the female worms, which appear to be variable, the males of the various species being indistinguishable from one another. He concludes that *H. fuhrmanni*, *H. pseudocontortus* and *H. atectus* are specifically identical with *H. contortus* and that *H. cervinus* and *H. bispinosus*, which he leaves as "species inquirendae" are also probably identical with *H. contortus*.—E. L. TAYLOR.

I. CLAPHAM, Phyllis A. (1934). **Some Observations on the Response of Chickens to Infestation with** *Heterakis gallinae*.—*J. Helminth.* **12.** 71-78. 5 tables. [11 refs.]

II. CLAUSSEN, L. (1934). Ueber Spulwurminvasion (Heterakidiasis) bei Hühnern. [**Heterakis Infection in Fowls**].—*Dtsch. tierärztl. Wschr.* **42.** 17-20. 5 figs. [10 refs.]

I. Although it appears to be impossible to build up heavy infestations of *H. gallinae* in the chicken and some immune response would appear to be involved, the author was unable to find any evidence either of a natural age immunity or of an acquired immunity in infection experiments carried out on chickens. Observations carried out on the duration of the infectivity of eggs in the soil showed that they were able to produce infestation after a rest of at least 12 months, 9·5 per cent. of the eggs proceeding with their development when fed to chickens.

II. Emaciation and paralysis, manifested in eight fowls by dropped wing and great weakness in the legs was observed to be associated with a heavy infestation of *H. papillosa* in the caeca. The author refers to this worm as the "pheasant heterakis" and describes lesions in the caeca which he considers to be identical with those found in the caeca of infested pheasants. [*H. perspicillum* (a synonym of *H. gallinae*) is common in the caecum of the fowl: the worm which causes nodular disease in pheasants, and which has very occasionally been observed in fowls, is called *H. isolonche*. Claussen does not give any description of the worms].

—E. L. TAYLOR.

CUILLÉ, & DARRASPEN. (1934). Considérations sur la strongylose cardio-pulmonaire du chien. [**Cardio-Pulmonary Strongylosis in the Dog**].—*Rev. vét., Toulouse.* **86.** 481-486.

This is a brief account of some of the clinical aspects of haemostrongylosis in the dog. The condition is an endarteritis obliterans of the branches of the pulmonary artery. In young animals the lesions are of the nature of broncho-pneumonia and emphysema. There is always hypertrophy of both sides of the heart and sometimes dilatation. In adults, in addition to the heart changes, there is a perivascular sclerosis and emphysema. Side by side with these changes there is hypertrophy of the liver and consequently ascites. This may last several months, even several years. The authors have seen abdominal dropsy develop six years after the diagnosis of haemostrongylosis.—A. W. N. PILLERS.

I. UNDERWOOD, J. R. (1934). **Equine Dhobie Itch, a Symptom of Filariasis. A Report of Fifty-Six Cases.**—*Vet. Bull. U.S. Army.* **28.** 227-236. 1 table. [8 refs.]

II. GULATI, R. L. (1934). **Filaria Haemorrhagica in Cattle and its Treatment.** —*Ind. vet. J.* **11.** 32-34. [2 refs.]

I. The author gives an account of chronic remittent dermatitis of horses, characterized by the eruption of a few or many patches of nodules and known in the Philippine Islands as " dhobie itch ". A study was made over a period of 12 months on 38 horses and 18 mules. During this time observations were made on the symptoms, their relation to seasons and climatic conditions and examinations were carried out on skin scrapings, skin sections and blood samples and other tissues. During the course of the observations a microfilaria was discovered in the reticular layers of the corium and was found in that situation in all the lesions subsequently examined, but was not found in any other tissue. This microfilaria differs from all those described in the literature which the author was able to consult and appears to be a new species. A search was made for the adult worm on *post-mortem* examination of three affected animals, but none could be found.

II. A very brief account is given of *Filaria haemorrhagica* [*Parafilaria multipapillosa*] and the lesions which it causes in the skin of Indian cattle. One or two intravenous injections of 100 c.c. of a 1 per cent. solution of tartar emetic is found to be very effective for the destruction of the parasite.—E. L. TAYLOR.

IMMUNITY.

VALCARENGHI, E. (1934). L'action anallergique de l' " exotuberculine éteinte ", chez les Bovins tuberculeux. [**The Anallergic Action of " Extinguished Exotuberculin " on Tuberculous Cattle**].—*Bull. Acad. vét. Fr.* **7.** 307-311. [3 refs.]

In this paper the author gives unequivocal support to the findings of FINZI, who first demonstrated that a tuberculin could be produced which, when injected into either tuberculous or healthy animals, failed to produce any thermic or allergic response. This product is not ordinary diagnostic tuberculin which has been rendered atoxic, but one which contains a specific antigen demonstrable by a flocculation test with antituberculosis serum. The author considers that this product in some form or other promises to be of value as an immunizing agent.

This tuberculin (" exotuberculine éteinte ") is formed by tubercle bacilli whose power to produce diagnostic tuberculin has been destroyed by growth at 41·5° to 42·0°C. for a period of from 10 to 15 days.—GWILYM O. DAVIES.

KFOURI, & MALOU. (1934). L'épidermo-tuberculination chez les Animaux. **[Cutaneous Tuberculin Reactions].**—*Rec. Méd. vét.* **110.** 596-605. 1 fig.

Malou has previously published a note [this *Bull.* **4.** 43.] on a cutaneous tuberculin reaction, using special discs impregnated with concentrated tuberculin which are applied to scarified areas on the skin. The present communication embodies the results of testing a series of horses, cattle and monkeys by this method.

In the horse, the reaction commences at the 18th hour as an oedematous, hot swelling: later small vesicles appear which rupture, forming yellowish crusts. In cattle (caudal fold or skin of ear) the reaction is of the nature of a soft but definitely circumscribed swelling. It is admitted that the interpretation of the test is somewhat difficult without considerable experience, since there is only a slight demarcation between positive and negative swellings.—R. E. GLOVER.

BELLER, K., & TAHSIN, S. (1934). Eine neue Applikationsart des Malleins. **[A New Mallein Test].** —*Berl. tierärztl. Wschr.* **50.** 191-192. 1 table. [8 refs.]

The active principle of raw mallein is precipitated with alcohol, and the precipitate is dried, ground and added to lactose in a proportion of 1 : 50. Glycerin is added and the resultant paste is evaporated. Small discs weighing 0·05 g. and containing 0·001 g. of dried mallein are thus prepared and for use one disc is inserted into the conjunctival sac of a horse to be tested. The disc dissolves in the eye in 30 to 60 seconds. On the basis of comparison with ordinary liquid mallein on over 700 equines, the authors state that their dry antigen is easier to apply, has greater precision with regard to dosage, is equally efficacious and gives rise to a more rapid reaction than liquid mallein.—J. E.

WILSON, G. S. (1934). **The Reputed Antigenic Relationship between Organisms of the Brucella Group on the One Hand, and of the Pasteurella, Pfeifferella and Proteus Groups on the Other.**—*J. Hyg., Camb.* **34.** 361-371. 3 tables. [25 refs.]

During recent years, statements have appeared in the literature suggesting the existence of an antigenic relationship between *Brucella* strains on the one hand and strains of *Pfeifferella*, *Pasteurella* and *Proteus X* on the other. The relevant literature is criticized and the opinion, which is based on experimental evidence, is given that no such relationship exists and that workers who have supported such a relationship have not taken into account the presence of normal agglutinins for certain bacteria in a given sample of serum. It is also pointed out that, in order to diagnose infection by the agglutination reaction, due regard must be paid to the normal level of agglutinins in a given host species, and that suspensions of bacteria for agglutination purposes must be prepared from smooth strains. It is, of course, admitted that numerous instances of the possession of a common antigen even by organisms of different genera exist, e.g., pneumococcus Type II and *Bact. friedländeri* Type B, but such relationships are supported by immunological data.
—R. LOVELL.

NELSON, J. B. (1934). **The Maternal Transmission of Vaccinal Immunity in Swine. II. The Duration of Active Immunity in the Sow and of Passive Immunity in the Young.**—*J. exp. Med.* **60.** 287-291. 3 tables. [1 ref.]

In a previous communication [this *Bull.* **3.** 706.] Nelson showed that maternal immunity to vaccinia in sows was transferred to their offspring by way of the colostrum. In the present article, the duration of this immunity has been studied by following two immune sows through six successive farrowings. A proportion of the piglets from each litter were tested cutaneously with vaccinia during the

first or second weeks of life and all were completely immune. It is suggested that this immunity was entirely passive, since the protection began to decline four to five weeks later and was entirely lost when the pigs were weaned.

Vaccinia introduced cutaneously during the first few days of life in passively protected pigs failed to reinforce their immunity.—R. E. GLOVER.

ANDERSON, E. J. M., & FRASER, A. H. H. (1934). **The Influence of Nutrition on the Natural Immunity Reactions of the Blood and on Skin Reactions to Bacterial Toxins.**—*J. Immunol.* **27.** 1-16. 4 figs. [21 refs.]

It is well known that nutritional factors are concerned in the natural resistance of the animal body to infective disease. Sheep fed with a maintenance diet adequate in protein, minerals and vitamins were compared with those fed on a similar diet supplemented with maize starch. The bactericidal effect of the sera towards *Bact. coli* showed no difference between the two groups. On the other hand, the sera of the sheep on the high carbohydrate diet showed an increased haemolytic action for rabbit red cells and an increased content of complement. Agglutinins for *Br. abortus* were lower in the carbohydrate fed group and there was no difference in the effect of intradermal injections of toxins of *Clostridium welchii*, *Cl. septique* and *Staphylococcus*. There were no differences in the immunity reactions with two other groups of sheep, one of which had extra rations consisting of cod liver oil and calcium.

The physical condition of sheep with the carbohydrate ration of maize starch was better than those without this ration. The calcium and cod liver oil also appeared to bear a relation to increased weight in the second experiment.

—R. LOVELL.

RAMON, G., LEMÉTAYER, E., & RICHOU, R. (1934). Nouveaux essais sur l'influence de l'addition de substances non spécifiques à l'antigène dans la production de l'immunité antitoxique. **[Effect of the Addition of Non-Specific Substances to the Antigen in the Production of Antitoxic Immunity].**—*C. R. Soc. Biol. Paris.* **116.** 823-826. 2 tables. [2 refs.]

Various substances were incorporated with formolized tetanus and diphtheria toxins to determine whether the injection of such mixtures into guinea pigs or rabbits produced an increased amount of antitoxin. It was shown that the incorporation of the toxins in lanoline, or better, lanoline oil, resulted in the production of increased amounts of antitoxin. It appears to be a similar phenomenon to that produced by the addition of tapioca, whereby the toxins are absorbed more slowly and is associated with the local inflammation produced by the non-specific substances. Bile and cholesterin appeared to produce reverse results.—R. LOVELL.

DISEASES, GENERAL.

BING, J. (1934). **Investigations of the Mechanism of Albuminuria. II. (The Albumin-Globulin Quotient).**—*Acta path. microbiol. scand.* **11.** 323-334. 3 figs., 3 tables. [16 refs.] [Orig. in English].

Instead of using the A/G quotient, the author expresses the amount of albumin present as a percentage of the total protein. This is referred to as " r.A per cent." In the varying albuminurias it ranges from 75 to 90. In amyloid nephrosis it is below 50. If the r.A per cent. of the urine is divided by the r.A per cent. of the blood, there is then obtained the renal factor " R ". This is constant for the same individual, but is different as between individuals. Even if the r.A per cent. of

the blood is experimentally altered by injection, R is unchanged. It is concluded that the changes seen in the urine during the progress of albuminurias are due to changes in the blood and not to alterations in the kidney condition. The transfer of proteins from blood to urine is by filtration, and, therefore, R expresses the permeability of the glomeruli. The greater is R, the less the permeability for globulin.—HENRY DRYERRE.

SMIRK, F. H. (1934). **The Functional Pathology of Advanced Chronic Nephritis.** —*Proc. R. Soc. Med.* **27.** 1485-1489. 4 figs.

Ordinarily the percentage concentration of every constituent of urine differs from its concentration in plasma but, in advanced chronic nephritis, the kidneys have a diminished capacity to form a normally high concentration of urea, creatinine or sulphate in the urine, and the composition of the urine, as far as these components are concerned, approaches that of the plasma from which it is formed. In contrast to these constituents the urine chloride percentage is almost invariably below the plasma chloride percentage even when there is an excess of salt in the patient's diet. The author studied this phenomenon by giving 15 g. of urea dissolved in 100 c.c. of water to normal patients and to some suffering from advanced chronic nephritis. He concludes that the defective chloride secretion in nephritis could not be attributed solely to a depletion of the chloride reserves of the body and that it was mainly due to a defect of renal origin. He suggests that damaged renal tubule cells are no longer able to resist the diffusion of water and the results obtained are discussed from this point of view.—JAMES STEWART.

PILLERS, A. W. N. (1934). **Autumnal Itch.**—*Vet. Rec.* **14.** 1285-1286. 1 fig.

Pillers records that " harvest bugs " have been extremely prevalent during August and September, 1934. A common species is *Trombicula autumnalis* (*Trombidium holosericum*). Specimens were received from rabbits, cats, horses, dogs and man. The severe irritation which is set up sometimes results in a pustular dermatitis. A satisfactory treatment is the application of derris powder either as an ointment or an aqueous solution.—J. S. STEWARD.

PIENING, C. (1934). Zur Kenntnis der Blutbildes bei der Rinderleukose. [**The Blood Picture in Bovine Leucosis**].—*Berl. tierärztl. Wschr.* **50.** 580-582. 1 table. [36 refs.]

In a group of 142 cattle the author found 55 showing abnormal blood pictures. Of these, 14 cases showed anaemia but a normal leucocyte count ; five showed combined anaemia and leucopaenia ; six showed an anaemia combined with a leucaemia, the leucocyte count being raised as high as 49,000 ; whilst 30 cases showed varying degrees of leucaemia but a normal erythrocyte count. The literature dealing with normal and abnormal blood counts is discussed.

—E. J. PULLINGER.

SCHÖTTLER, F. (1934). Ueber Aetiologie und Therapie der aleukämischen Lymphadenose des Rindes. [**Cause and Treatment of Aleucaemic Lymphadenosis of Cattle**].—*Berl. tierärztl. Wschr.* **50.** 497-502 and 513-517. [56 refs.]

By the inoculation into healthy cattle of lymph-gland suspension from cattle affected with lymphadenosis, the authors succeeded in producing a lymphocytosis together with the appearance of lymphoblasts in the blood stream. Formerly (1920) DU TOIT produced a lymphocytosis by the inoculation of affected gland material, and a general leucocytosis by the inoculation of normal gland material.

Believing that lymphocytes and other leucocytes have a similar origin, DU TOIT considered that there was no significant difference between these results. The present author, however considers that such experiments support the dualistic theory of the origin of leucocytes and that they constitute evidence of the infectivity of lymphadenosis. This condition is probably caused by a filtrable virus.

Amongst a group of 1,100 cattle, losses from this disease were reduced from 8 per cent. to 1 per cent. by the inoculation of serum from convalescent cases.

—E. J. PULLINGER.

MCPHEE, H. C., & ZELLER, J. H. (1934). **The Stillborn Pig.**—*J. Amer. vet. med. Ass.* **85.** 224-231. 1 fig., 2 tables. [3 refs.]

The purpose of this paper is to analyse data pertaining to still births in swine. A study was made of the pigs found dead at birth in 1,121 litters comprising 8,991 piglets. The number born dead was 497 in 259 litters. Very large and very small litters contained a higher percentage of still-born young than litters of medium size. Litters of 1, 2, 12 and over averaged 11·7 per cent. dead at birth, whereas all others averaged 3·9 per cent. Pigs dead at birth were heavier than live ones, but the variation in weight was greater than in the live piglets. The causes of still births are primarily biological and concern prenatal development, nutrition, age and care of the mother, and the occurrence of pathological conditions. Inheritance may be involved. There is urgent need for further research on this subject.—A. W. N. PILLERS.

NIEBERLE, K. (1934). Zur Frage des plötzlichen Herztodes bei Schweinen und seiner Entstehung. [**Syncope in Pigs**].—*Tierärztl. Rdsch.* **40.** 365-371. [23 refs.]

Sudden death due to heart failure in pigs is an important condition which has received the attention of numerous research workers. Nieberle reviews the opinions of several of these. He then discusses angina pectoris of man and comes to the conclusion that arteriosclerosis with lesions of the intima has no place in veterinary pathology. He then gives a full account of the lesions and circumstances under which death occurs from syncope in pigs. A number of factors are concerned in its aetiology. Experimental proof of some of them is given. The effects of histamine on capillaries, and of acetycholine on arterioles, are considered, as are those of anaemia, overfeeding, spasm, infection, and intoxication. The anatomical foundations consist of crater-like areas of loss of conductivity in the heart muscles, especially in the left papillary muscle, left chamber wall, and septum. Pathologically there is a direct connection between these areas of necrosis and infectious diseases and intoxications. Coronary interference upsets the relationship between the blood supply and blood requirements. So is it with organic change in the coronary vessels, or in the commencement of the aorta and in spasm of the coronary veins. A general anaemia brings about a similar inbalance between blood requirement and blood supply. In addition to this, there are other factors in the heart muscle itself, which may be hereditary or acquired. Prevention consists of removing the known causes, such as overloading the stomach, the taking of irritant or highly albuminous foods, and forced exercise. Young animals should be allowed exercise in the fresh air.—A. W. N. PILLERS.

MURNANE, D. (1933). **Footrot in Sheep.**—*J. Coun. sci. industr. Res. Aust.* **6.** 252-259.

Our present knowledge of foot-rot, a disease of considerable economic importance in Australia, is discussed and the results of the author's investigations up to

the present are briefly given. Two distinct types of the disease are recognized : the subacute type which is the most prevalent, and the less common acute or malignant type. In the former type the infection commences as an inflammation of the skin between the digits and later the horn becomes under-run. In the malignant type the lesions occur in the pastern or in the fetlock joint ; sinuses usually form and ligaments and tendons are often involved. *Bacillus* [*Actinomyces*] *necrophorus* is thought to be the causal organism of both types as it has been demonstrated in nearly all cases examined. In two or three cases spirochaetes were seen in smears from lesions, but it is questionable whether these were pathogenic.

Experiments were conducted to demonstrate the infectious nature of the disease. Sheep were run in pens together with cases of foot-rot. The first experiment was carried out during the summer, the soil being kept moist by hosing. No transmission took place in this instance, but when the experiment was repeated during the winter, all in-contact animals developed the disease. Control animals running under similar conditions in another pen, but having no contact with affected sheep, remained normal.

The disease was reproduced experimentally by scarifying the skin between the digits and applying pus from natural cases. Filtrates of infective material did not set up the disease. Cultures of various organisms isolated from foot-rot were applied to sheep's feet after scarification ; foot-rot developed when *A. necrophorus* cultures were used, but not from the use of other cultures.

Only preliminary investigations on the treatment of foot-rot have been conducted to date. The usual measures are discussed and attention is drawn to the necessity of taking early action and isolating affected animals. Whatever disinfectant mixture is used curatively, the most important factor is the length of time the feet are immersed. It is, therefore, recommended that the sheep should be stood in a foot bath for at least one hour.—W. I. B. Beveridge.

Pekar, J. (1934). Pemphigus porcellorum. [**Eczema in Piglets**].—*Zverolék Obz.* **27.** 263-266. 2 figs.

Eczema is one of the most serious contagious diseases affecting piglets and is the cause of heavy losses in pig breeding. It usually attacks all the piglets of a litter and occurs enzootically in some herds. Eczema is considered by many veterinarians to be incurable, but in the opinion of the author it can be cured, when diagnosed at an early stage and properly treated. All eczematous piglets are also affected with septic omphalophlebitis.

The author reports success in treatment with a proprietary preparation (" haemosepticin ").—E. Pribyl (Brno).

Schlotthauer, C. F., & Bollman, J. L. (1934). **Spontaneous Gout in Turkeys.** —*J. Amer. vet. med. Ass.* **85.** 98-103. 3 figs. [4 refs.]

Spontaneous gout was observed in several groups of turkeys, showing typical tophi and articular involvement. The uric acid content of the blood and of the material in the tophi was determined, and in all affected birds the uric acid content of the blood was increased. The nodules and joint cavities contained masses of white semi-solid material consisting of sheaves of needle-shaped crystals enclosed in connective tissue. In badly affected birds the same material was deposited subcutaneously, and in the fascia of the muscles. Visceral gout was not observed. The fertility of the eggs from the flock was greatly diminished, and there was a high death rate in poults hatched from them. The aetiology was obscure, but diet, age and exercise play a definite part in the incidence.—R. F. Gordon.

FASSNACHT, H. (1934). Zur Histopathologie der Herzveränderungen bei Struma. [**The Histopathology of Heart Lesions in Goitre**].—*Arch. wiss. prakt. Tierheilk.* **67.** 396-404. 3 figs., 2 tables. [31 refs.]

The association of dilatation of the right ventricle with goitre has been frequently commented upon by many workers. No satisfactory explanation has, however, been given for the genesis and cause of the lesion : some authors have defined the dilatation as being due to pressure in the vagus and sympathetic by the diseased thyroid, while others contend that it is part of the general organic disturbance which occurs in certain toxic goitres. A brief review of the literature dealing with similar observations in animals is given. The investigation consisted of the histological study of the heart, thyroid and vagus and sympathetic nerves from 20 cases of goitre in dogs, and of eight museum specimens, the latter including one case from a cat and one from twin lambs. The majority of the goitres were neoplastic (adenocarcinoma), a few were malignant with metastases ; the remainder were either parenchymatous or colloid goitres. Macroscopic changes were observed in the heart in 23 of the 28 cases and, of these, 16 on histological examination showed hyaline and fatty changes and loss of cross striation in the muscle fibres and degeneration of the nuclei. In the remainder, small foci of lymphocytes, leucocytes and histiocytes were seen. The lesions bore no relation to the type of goitre. The vagus and sympathetic nerves were apparently normal and, therefore, the degenerative heart lesions must have been caused by some toxic disturbance.—J. R. M. INNES.

BAUMGÄRTNER, H. (1934). Weitere Mitteilung zu dem sog. Basalzellenkrebs des Hundes. [**Further Note on Basal Cell Cancer of the Dog**].—*Arch. wiss. prakt. Tierheilk.* **67.** 532-533.

This is a very short communication recording three further cases of basal cell carcinoma of the skin in dogs, which had been previously described in the same journal [this *Bull.* **4.** 624].

Although only five cases have been observed, the conclusions are that the German sheep dog is particularly susceptible, that the predilection site is in the region of the neck, and that the tumour is benign in character.—J. R. M. INNES.

BAUMGÄRTNER, H. (1934). Ueber einen Fall von Deckzellengeschwulst des Bauchfells beim Kalbe. [**A Neoplasm of the Peritoneal Epithelium in the Calf**].—*Arch. wiss. prakt. Tierheilk.* **67.** 525-531. 2 figs. [7 refs.]

A case of multiple " peritoneal endothelioma " in a three-week-old calf is described. Numerous nodules ranging from the size of a small pea to that of a large hazel nut were present on the peritoneum and on the surface of the liver and spleen. The histological appearances are described in detail. No other growths were found in any other part of the body ; the conclusion drawn was, therefore, that this represented a true case of multiple tumour growth. As the neoplasm was apparently confined to the surface of the peritoneum, it was considered that it could be related genetically to the epithelium [mesothelium] and because of the age of the calf probably due to some maldevelopment of the peritoneal anlage.

[In English literature such tumours arising from serous membranes are usually referred to as endotheliomata, but the question of their origin, whether from the epithelium or, as in this case, the subperitoneal lymph spaces, has been a matter of fruitless discussion].—J. R. M. INNES.

LOMBARD, C. (1934). Parasites et Cancer. [**Parasites and Cancer**].—*Rev. vét., Toulouse.* **86.** 361-382.

The question of the relationship of cause and effect between the co-existence of parasites and cancer has been amplified and given a new aspect by the work carried out during the last few years. That ascomycetes, blastomycetes and sarcosporidia cause cancer is now dismissed, but with higher parasites there is more genuine doubt.

BORREL in 1906 found the cysticercus of *Taenia crassicollis* in a sarcoma in a rat's liver. Since then, many other parasites, i.e., worms and arthropods have been reported as having been associated with tumour formation, viz : cestode cysts in various organs, trematodes in the liver, nematodes in the stomach, bronchi and lungs. Similarly, BORREL and others have also attributed cancer formation to various members of the Acarina and Insecta. There is something more than coincidence in the co-existence of these macroparasites and cancer. Experimental evidence has indisputably established the pathogenic role of *Gongylonema neoplasticum* and the cysticercus of *Taenia crassicollis.*

The crux of the question is the manner in which these parasites produce their effects. Some think that they are simply mechanical or chemical irritants. BORREL and his school believe that they are necessary to tumour formation. The physical or chemical agents prepare the way for the parasites, which then sensitize the cells to the action of a carcinogenetic virus which they carry. The virus has not yet been discovered, but the way has been opened up for further work.

—A. W. N. PILLERS.

I. HARTWIGK, H. (1934). Beobachtungen über die Marek'sche Hühnerlähme im Jahre 1933. [**Observations on Fowl Paralysis in 1933**].—*Tierärztl. Rdsch.* **40.** 139-142. 4 figs. on 1 plate, 1 table. [10 refs.]

II. MORAX, TRUCHE, & NIDA. (1934). Les troubles oculaires dans la paralysie des gallinacés. [**Eye Changes in Fowl Paralysis**].—*Bull. Acad. vét. Fr.* **7.** 174-175.

III. EMMEL, M. W. (1934). **The Etiology of Fowl Paralysis (Neurolymphomatosis Gallinarum-Pappenheimer), Leucosis and Allied Conditions in the Domestic Fowl.**—*J. Amer. vet. med. Ass.* **85.** 96-97. [3 refs.]

I. This is a general survey of the disease known as fowl paralysis. The author records his findings in a number of cases which he has investigated and compares them with those recorded in the literature. The disease is essentially one of young birds, the cause of which he believes to be a virus. The minimum period of incubation is from eight to nine weeks. Only birds up to the age of 14 weeks appear to be susceptible to infection by contact. Neither vitamins, minerals nor the protein constituents of feeding stuffs play any part in the causation of the disease.

In Saxony the percentage of birds examined *post mortem* at veterinary laboratories and found to be affected with fowl paralysis increased from 8 per cent. in 1932 to 12·5 per cent. in 1933. In individual outbreaks from 0·5 to 20 per cent. of the flock were affected and the incidence of the disease was greatest in the warm months of the year, rising to a peak in August.

II. The authors examined histologically the eyes of eight birds obtained from flocks where there was clinical evidence of the existence of fowl paralysis. They found that there was primarily a large mononuclear cell infiltration with consequent alterations in the ciliary body, cornea and iris, with a variable degree of depigmentation of the latter. The lens may be opaque and the choroid is sometimes involved.

III. This is a preliminary notification that the author intends shortly to publish evidence on this problem showing that :– (1) the same aetiological agent is responsible for fowl paralysis, leucosis and allied conditions ; (2) the primary aetiological agent is non-specific, and (3) enteritis is a necessary predisposing factor and is frequently associated with the presence of organisms of the typhoid group and intestinal parasites. The exact method by which the aetiological agent induces the disease is not yet understood and its effect is dependent upon the severity of the enteritis and the inherent properties of the organism acting as the predisposing cause.—N. S. Barron.

I. McIntosh, R. A. (1934). **Report of the Committee making a Survey of Mineral Deficiency Disease in Cattle for the Year 1933.**—*Rep. Ontario Vet. Coll. 1933.* pp. 20-24. 2 figs., 3 tables.

II. Maignon, F. (1934). Les maladies de carence et les substitutions alimentaires. [**Deficiency Diseases and Food Substitutes**].—*Rev. vét. milit.* **18.** 201-214.

III. Turner, W. A., Meigs, E. B., Kane, E. A., Shinn, L. A., & Hale, W. S. (1934). **The Comparative Effectiveness, in the Dairy Ration, of Supplements of Phosphorus in the Form of Orthophosphoric Acid, Monosodium, Disodium, Trisodium Phosphates, and Bone Meal**].—*J. agric. Res.* **48.** 619-630. 2 figs., 2 tables. [7 refs.]

I. A very useful report providing information for Canada, hitherto lacking. Analyses of feeding materials suggest that repeated cropping has depleted soil minerals in some areas. Addition of dilute phosphoric acid to the dietary of cows on supposedly phosphorus-low rations in Bruce County and Wellington County did not materially raise the inorganic P of the blood but improved condition and milk yield, and appeared to prevent pica when the cows were turned out to grass.

A natural aphosphorosis occurs in certain areas of Ontario especially in dry years. This should be corrected by feeding P-rich supplements or by use of fertilizers.

II. A semi-popular article, without bibliography, on deficiencies of vitamins, amino-acids and certain minerals.

III. Balances for Ca and P are given in two experiments on three cows over successive three week periods. The differences observed between the different phosphates do not warrant definite conclusions. The authors consider that considerable quantities of Ca and P may be retained in the alimentary tract for several weeks and that there is no way of differentiating this from a true positive balance [mineral retention in the tissues] in experiments of short duration.—H. H. Green.

PUBLIC HEALTH.

Torrance, H. L. (1934). **The Problem of Tuberculous Milk.**—*Vet. Rec.* **14.** 815-820. 1 table.

In this address the author begins by presenting a detailed account of the powers held by a local authority to deal with tubercle bacilli in milk. He is of the opinion that the administration of these powers can and does have the effect of lowering the incidence of such infection. A table is given illustrating this point and a list of six suggested measures which local authorities might adopt. Useful statistical evidence shows that cows with healthy udders very frequently excrete tubercle bacilli in their milk. The reliability of microscopic examination of milk samples is emphasized. It appears that it has been a regular practice in Nottinghamshire

to take bulked milk samples from individual herds and submit them to a biological examination. The importance of this excellent practice is clearly shown. This paper enthusiastically supports routine clinical veterinary inspection of dairy cattle even in the absence of testing with tuberculin, as a means of reducing the incidence of tuberculous infection in milk.—L. JORDAN.

SAVAGE, W. G. (1933). **Milk Pasteurisation as a Technical Problem.**—*J. Hyg., Camb.* **33.** 42-54. [30 refs.]

The author points out that, if pasteurization is to become a regular part of public health measures, it is essential to consider the problems and make the process as satisfactory as possible.

He affirms that " flash " pasteurization is unreliable and then defines the English standard of pasteurization by the " holder " method. He discusses the various methods, pasteurization in the bottle, electrical treatment of milk, and stassanization of milk, which is in reality a variant of the " flash" method but without its objections.

As the " holder " system has attained wide recognition, the author describes this type and points out the difficulties related to its use, especially as regards the " cream line " and goes on to give a description of the types of " holder " pasteurization plant such as (a) vat or batch pasteurizers, (b) separate heaters with separate holder tanks and (c) the flow retarder.

The author then describes the defects of pasteurizing plants and indicates what steps may be taken to remedy them. He gives his ideas as to how these plants should be inspected and considers that not only should the apparatus be as nearly perfect as possible, but that, to avoid errors in the human element, those working the pasteurizers should do so only under licence granted by the local authority. While not wishing to make a privileged class with corresponding high wages, he considers that this would have a steadying effect on those employed.

Savage expresses doubt as to the value of a fixed bacterial standard for pasteurized milk, but states that the requirement of the Ministry of Health is " On a sample of milk being taken at any time after pasteurisation and before delivery to the consumer, the milk shall be found not to contain (a) more than 30,000 bacteria per c.c., nor (b) any *Bacillus coli* in one-tenth of a c.c." [This, however, is the standard laid down by the Ministry of Health for " Grade A Pasteurized Milk ", and is not the ordinary English standard as stated].

The writer concludes by giving his proposals as set out elsewhere by him, namely

" (i) That permissive powers be granted to the larger Urban areas to require that all milk coming into the area be efficiently pasteurised, or be from tuberculin tested herds. This permissive power to be only granted after an enquiry by the Ministry of Health, who would have to be satisfied that the necessary technical problems could be adequately dealt with. A time limit would be necessary to allow of any adjustments.

" (ii) The prohibition of all forms of heat treatment, other than efficient pasteurisation, for liquid milk coming into the approved Urban area. No milk to be pasteurised twice."

—D. S. RABAGLIATI.

I. DE VINE, W. J. B. (1934). **The Development of Official Control in Meat Inspection.**—*Vet. Rec.* **14.** 1041-1045. [4 refs.]

II. GOFTON, A. (1934). **Notes on the History and Development of Meat Inspection in Edinburgh.**—*Ibid.* 1045-1050.

I. A short outline of the history of meat inspection in general is followed by an outline of its development in England and Wales. The various acts and regulations regarding the inspection of food are mentioned, and a plea is made for control

by veterinary surgeons with a view to improving the system of inspection generally.

II. Meat inspection in Edinburgh is traced from the system carried out by the Incorporation of Fleshers in 1488 up to the present time. Some interesting cases are quoted illustrating the traffic in diseased meat, and the evolution of the present system is outlined.—D. J. ANTHONY.

THERAPEUTICS.

FREEBORN, S. B., REGAN, W. M., & BERRY, L. J. (1934). **The Effect of Petroleum Oil Sprays on Dairy Cattle. [As Fly Repellants].**—*J. econ. Ent.* **27.** 382-388. [6 refs.]

In previous papers [this *Bull.* **3.** 439.] the authors have shown that burning of the skin occurred after the use of oil sprays of low viscosity, or of low unsulphonated residue, or with oils of high viscosity unless the unsulphonated residue was also high. When the environmental temperature attained between 80° and 85°F. the " pyrexial point " was reached and the cows were unable to control body temperature which quickly rose above normal.

In the present paper data are recorded that tend to refute the previously suggested explanation that the increased temperatures caused by oil sprays was due to the mechanical blanketing and it is now suggested that the cause may be chemical combination with the body tissues. It is estimated that the normal loss of moisture at 84°F. is 414 g. per hour, whereas for a lightly sprayed cow it was only 223 g. per hour. It was also found that 32 per cent. of a normal cow's cooling power, under these environmental conditions, was obtained by evaporation of moisture from the skin. By spraying, this was reduced to 17 per cent. The result was that more heat was produced than could be dissipated and the consequent rise in temperature increased the body metabolism, thus producing more heat.

Formulae are given for two aqueous emulsions in which there is less petroleum oil. The application of these caused no rise in temperature but did produce a loss in transpired water, though at 80°F. this was apparently compensated for by increased respiration, sweating and body radiation ; at higher environmental temperatures some rise in body temperature would be expected.—J. S. STEWARD.

CRANE, D. B. (1933). **Some Studies on the Use of Rotenone as a Canine Insecticide.**—*Rep. New York State Vet. Coll. 1931-32.* pp. 86-120. 13 tables. [112 refs.]

Working with dogs, it was found that the fatal dose of rotenone was more than 0·2 g. per kg. body weight. Dogs of all ages were tested, those receiving 0·1 g. per kg. or over often vomited and some were purged, but none died. The optimum anthelmintic dosage was 0·05 g. per kg. after 24 hours starvation.

Six of eight dogs infested with *Ancylostoma caninum*, six of eight dogs infested with *Toxascaris limbata* and eight of ten puppies infested with *Belascaris marginata* were negative by faecal examination after treatment. One dog was negative after treatment for *Trichuris depressiusculus*.

Rotenone had no effect on tapeworms. When used in 1 per cent. solution dissolved in one part of acetone, added to five parts of alcohol and four parts of water, it gave remarkable results as a dressing for demodectic mange. Infestation with *Eimeria canis* was lessened after dosage with rotenone.—HARVEY S. PURCHASE.

CHOPRA, R. N., GHOSH, N. N., & MUKERJI, A. K. (1934). **Anthelmintic Properties of** *Vernonia anthelmintica* **Willd. (Syn.** *Serratula anthelmintica*).—*Indian J. med. Res.* **22.** 183-186. [3 refs.]

The seeds of *Vernonia anthelmintica* contain 18 per cent. of a fixed oil, 0·02 per cent. of an essential oil, a bitter principle, and resin, tannins, etc. It has no action whatever against hookworms or tapeworms. Doses of 30 to 60 grains of powdered seeds have a weak action upon *Ascaris*, and a stronger one on *Enterobius* of man. The same is true of the bitter principle when isolated. The action is enhanced when calomel is given before, and magnesium sulphate after administration. These actions are weaker and in no way comparable to those of other anthelmintics in the British Pharmocopoeia.—A. W. N. PILLERS.

YUTUC, L. M. (1934). **Experimental Studies on the Curative Treatment of Surra in Native Horses in the Philippines. I.**—*Philipp. J. Sci.* **54.** 9-27. 4 tables. [23 refs.]

" Etharsanol " (p-B-hydroxy-ethylamino-phenyl arsenic acid) alone was of little value in treating surra [*Tryp. evansi* infection] in horses. The free acid gave good results in those cases where the cerebrospinal fluid was free from trypanosomes. On the other hand, the combination of " etharsanol " with " naganol " had a beneficial synergistic action when administered in non-lethal but slightly toxic doses. Six of ten naturally infected horses and three experimentally infected horses, which showed cerebrospinal infection were cured. Three doses of these drugs were given at intervals of four days, the total dosage being 10 mg. of each per kg. body weight in 10 per cent. solution dissolved in water.

After trypanosomes had appeared in the blood of animals infected experimentally there was a period of 6 to 22 days before the organisms appeared in the cerebrospinal fluid : the curative treatment was then commenced.

—HARVEY S. PURCHASE.

PIRANI, A. (1934). Tripanosomi e Trypanbleu. [**Trypanosomiasis and Trypan Blue**].—*Profilassi.* **7.** 256-257. [Abst. from English and French summaries].

To avoid the transmission of trypanosomiasis during immunization against rinderpest in Eritrea, the author recommends the addition of an equal part of 1 per cent. trypan blue to virus blood [see also this *Bull.* **4.** 73].—J. E.

GÖTZE, R., & MÜLLER, J. (1934). Chemotherapie der Bangbakterieninfektion der Rinder. [**Chemotherapy of Contagious Abortion**].—*Dtsch. tierärztl. Wschr.* **42.** 469-474. 14 tables.

This describes experiments extending over four years on 36 maiden serologically negative heifers two to five months pregnant when infected. In most cases the small groups of test animals allotted to each drug were dosed five times and infected five times at alternate fortnights, the first treatment being with the drug. For infection 100 c.c. of live *Br. abortus* culture was given *per os.*

Drugs tested included " targesin " a silver compound, methylene blue, trypaflavine, tartar emetic and a number of secret remedies designated by symbols.

The authors consider that three of the latter did exercise a protective role against infection.—J. E.

KOCH, W. (1934). Hormonale Sterilitätsbehandlung. [**Hormonal Treatment of Sterility**].—*Dtsch. tierärztl. Wschr.* **42.** 433-437.

A summary of the existing knowledge of the treatment of sterility by means of hormones. The author, though he believes that much progress has been made, is far from advocating hormonal therapy as a general practice. Many cases have been treated successfully, but the treatment, he insists, must be done with

great care and a thorough knowledge of the technique is essential as already overdosage has been found to cause a pathological condition. He concludes that the stock-breeder of the future will have cause to be grateful for the work already done and that a great advance will be made once the physiology of the endocrine system is fully understood and the genetical side of successfully treated cases thoroughly investigated.—JAMES STEWART.

HAM, A. W., & LEWIS, M. D. (1934). **Hypervitaminosis D Rickets : The Action of Vitamin D.**—*Brit. J. exp. Path.* **15.** 228-234. 4 figs. [16 refs.]

Although a large amount of work is being carried out, the mode of action of vitamin D is still uncertain and the relationship between vitamin D and rickets is not at all a simple one in spite of the clear-cut beneficial effect of the vitamin in the treatment of rickets. The authors describe experiments carried out on 14 four-weeks-old rats whereby it was shown that rachitic lesions appeared in their long bones after three weeks of very large daily doses of vitamin D. From the poor calcification of the matrix it was concluded that the overdosage of the vitamin inhibited the normal process of calcification in bone. From the histological picture this could not be attributed to the agency of osteoclasts, which is a commonly accepted theory of calcium metabolism.

The authors conclude that the phenomena observed in their experiments can best be explained by a theory which considers vitamin D to act by increasing, in some way, the attraction of the blood for calcium. This would be compatible with the theory that vitamin D acts through the intermediary of the parathyroid mechanism to control a fraction of the serum calcium.—JAMES STEWART.

PHYSIOLOGY.

TRAUTMANN, A., & SCHMITT, J. (1934). Ein Beitrag zur Frage des Mageninhaltes bei Schweinen. Versuche an Schweinen mit Magenfisteln. [**Gastric Digestion in Swine. Experiments with a Gastric Fistula**].—*Dtsch. tierärztl. Wschr.* **42.** 496-498. 1 table. [English summary : abst. from orig.]

This is an account of an experiment in which gastric fistulae were made in three sows of known age and weight, in order that the food eaten could be collected and weighed at different intervals. Previous work has been done by feeding, killing, and then weighing the stomach contents. This method allowed only one determination for the same animal, and had other objections. The ration in the present instance consisted of known weights of fish meal, crushed soya bean, crushed barley, carrots and water. The pigs did well and gained 20 kg. in weight during the experiments despite handling, emptying and washing out the stomach. The amount of stomach content in different pigs varied considerably under identical conditions. Under exactly similar treatment it varied in the same pig on different days. A larger amount of food given does not always show a larger amount in the stomach than when a smaller amount is eaten. Violent exercise delays the passage of food into the small intestine.—A. W. N. PILLERS.

ELLINGER, P. (1934). Ueber neuere Arbeiten zur Funktion der Niere. [**Recent Work on the Function of the Kidneys**].—*Acta brev. neerl. Physiol.* **4.** 30-35.

A review of the more recent work on kidney function and present day theories of urinary secretion. Ludwig's theory still forms the basis of most work though his conception of the mechanism of the back absorption of water and salts by the cells of the tubules has been proved false. The author has done much work on

the back absorption by the cells, using the technique of dye secretion. He maintains also that the ammonia formation which takes place in the kidney cells is one of the important controls of the pH concentration of the body.—James Stewart.

Kritschewski, I. L., Tserikower, R. S., & Dwolaizkaja-Barischewa, K. M. (1933). Ueber eine noch unbekannte Funktion des Retikulo-endothelial-systems. XIX. Mitteilung. [**A Still Unknown Function of the Reticulo-Endothelial System. XIX**].—*Z. ImmunForsch.* **81.** 163-184. 7 figs., 6 tables. [40 refs.]

This article is one of a long series which have appeared in this journal and is considered to be further evidence of the authors' theory relating to another function of the reticulo-endothelial system. Briefly, the idea put forward is that, although the action of arsenical and other compounds on spirochaetal and protozoal infections is not fully understood, it can be explained by the fact that these compounds are actually absorbed by the cells of the reticulo-endothelial system and carried by these cells into the blood stream and to tissues which are poorly supplied with these cellular elements. In other words, the drug is probably concentrated by large macrophages in the neighbourhood of lesions.

The experiments described were carried out in mice infected with *Spirochaeta duttoni*, *Tryp. gambiense* and *Tryp. equiperdum*. Use was made of the blockade method with and without parallel splenectomy and subsequent infection. Staining methods were devised which demonstrated the presence in the actual cells of the compound used in the blockade method.

In view of other authors' assertions that colloidal copper causes a degeneration of the cells of the reticulo-endothelial system, histological examinations of various organs were carried out. The authors' conclusions were that, although this substance causes degenerative lesions of the kidney, liver and spleen, the functional activity of the various cellular constituents of the reticulo-endothelial system in these organs remains undisturbed.—J. R. M. Innes.

TECHNIQUE.

Seifried, O., Cain, C. B., & Wulf, H. (1934). Ein Halter zur Untersuchung und Operation von Hühnern und anderen Vögeln. [**A Table for Examination and Operations on Fowls and Other Birds**].—*Arch. wiss. prakt. Tierheilk.* **67.** 277-280. 4 figs.

The authors give an illustrated description of their improved bird holder for the humane restraint of fowls for operation. Those engaged in this field should consult the original.—J. E.

Steffan, H. (1934). Ein Schlauchstethoskop zu Herz- und Lungenauskultation mit Tonblende für Tier und Mensch. [**A Tube Stethoscope for Auscultation of Heart and Lungs with Adjustment for Animals and Man**]. —*Arch. wiss. prakt. Tierheilk.* **67.** 453-456. 1 fig. [3 refs.]

The author describes his improved stethoscope, which he has developed by experiment in recent years, in order to make it suitable for use on the heart and lungs of animals and man. The technical points are discussed and the instrument is illustrated plainly and schematically. The sound-collecting mechanism is parabolic in shape and is composed of thick metal covered with rubber. There is an adjustable diaphragm so that certain sound frequencies can be cut off or admitted selectively.—J. E.

MISCELLANEOUS.

BAUMANN, A., & WITEBSKY, E. (1934). Un nouveau phénomène pour la demonstration de la toxicité du serum. [**A Method for the Demonstration of Toxicity of Serum**].—*Ann. Inst. Pasteur.* **53.** 282-289. 3 figs., 5 tables. [6 refs.]

The authors have investigated the toxic action of serum on fertile hens' eggs, deprived of their shells and cultivated in glass dishes. When normal human or rabbit sera are added to the developing embryo, marked signs of shock are produced, shown by a contraction of the tissues and, possibly, the death of the embryo. Guinea pig or fowl sera are incapable of exerting this toxic action. Human serum inactivated by heat loses the power of inducing this phenomenon, but regains it on the addition of complement.

It is considered that these reactions are examples of anaphylactic shock, for the study of which the developing isolated chick embryo is particularly suitable.

—R. E. GLOVER.

I. —. (1934). Zur Lage des tierärztlichen Standes in Oesterreich. [**The Condition of the Veterinary Profession in Austria**].—*Oest. Tierarzt.* **6.** 141-143.

II. ALEKSA, K. (1934). Le développement de la Médecine vétérinaire en Lithuanie de 1918 jusqu'en 1933. [**Development of Veterinary Medicine in Lithuania 1918-1933**].—*Bull. Off. internat. Epiz.* **7.** 951-959. 6 figs., 1 table.

III. BECHTSCHET. (1934). Alt- und neuzeitliches Veterinärwesen in der Türkei. [**Past and Present State of Veterinary Medicine in Turkey**].—*Berl. tierärztl. Wschr.* **50.** 13-14.

IV. RICHTER, H. (1934). Die veterinären Verhältnisse in Persien. [**Veterinary Affairs in Persia**].—*Tierärztl. Rdsch.* **40.** 587-588.

I. The status of the veterinary profession in Austria is very low. It has no representative in the National Council. The veterinary High School in Vienna lacks funds for its professorships, and its research work is consequently handicapped. General practitioners and officials have so small an income that large numbers are suffering the bitterest poverty. Proposals are submitted to ameliorate the situation.

II. A veterinary department was established in Lithuania soon after the proclamation of the new state in 1918, and by 1920 there were 36 veterinarians on the register. By sending scholarship holders to Germany, Austria, France, Switzerland and, latterly, to Sweden to qualify, there are now available 88 qualified veterinarians of whom 50 are in the State service.

Rinderpest has been kept out of the country; contagious bovine pleuropneumonia has been suppressed; foot-rot in sheep has not been seen since 1924; glanders caused trouble for six years after the war, but has now been exterminated. Cases of mange have dropped from 295 in 1923 to 5 in 1933. Rabies, rife in 1923 and again in 1928 to 1929, is now rare. There were outbreaks of foot and mouth disease in 1922, 1925 and 1932. Swine fever is widespread and little improvement can be recorded. Blackleg and bovine contagious abortion are occasionally met with. Only 5 to 6 per cent. of cattle are infected with tuberculosis, but notification of tuberculosis is not obligatory. There is a serum laboratory at Kaunas.

III. A summary of a governmental report on the progress made in veterinary medicine in Turkey in the ten years of the Republic, compared with its state under the Sultans. Twenty-five years ago the veterinary surgeon had no recognized

standing, but with the establishment of the republic the profession was put upon a proper footing. Animal breeding acts have been passed and regulations issued making full use of veterinary surgeons, who are now made exempt from compulsory state service. Control of contagious diseases, especially rinderpest, was urgently necessary. In 1922, 1,951 districts were infected and over 27,000 animals, worth £650,000, died or were killed. In 1932 only eight districts were infected and only 166 animals killed and the country is now free. Similar progress has been made with other epizootic diseases.

IV. In a special report on the state of agriculture in Persia, published on the occasion of the recent visit of the Shah to Turkey, information is given as to the conditions of the veterinary service. The Institute of Hessarek in Persia which is in control of contagious diseases, is staffed by Persian and foreign specialists who prepare the different sera required for foot and mouth disease, rinderpest, etc. There are branch departments in Azerbaijan, Isfahan, and on the coast of the Caspian Sea, and ten further establishments are to be created this year. In 1933 a veterinary school was founded at Teheran.—F. BULLOCK.

OFFICIAL AND OTHER REPORTS.

SOUTHERN RHODESIA. (1934). **Report of the Director of Veterinary Research for the Year 1933.** [LAWRENCE, D. A.]. pp. 6. Salisbury: Govt. Printer. [fcp].

Mr. Ll. E. W. BEVAN retired in January after 26 years service and was succeeded by Mr. LAWRENCE. Mr. W. ORR was appointed Research Officer in April.

ROUTINE WORK.—The usual diagnostic work was performed. 141 out of 720 samples of bovine blood were positive for *Br. abortus* infection. A mixed vaccine of low virulence against *Babesia bigemina* and *Anaplasma marginale* is issued for use on calves and gives good results. A horse-sickness virus vaccine is prepared and 156 doses were issued during the year.

Cattle in lightly infested fly areas can be protected against trypanosomiasis if treated with antimony potassium tartrate (three fortnightly doses followed by monthly doses if necessary).

An antimyiasis vaccine [not described] is said to be useful against maggot (*Chrysomyia bezziana*) infestation.

RESEARCH.—Research on the duration of viability of horse-sickness virus in blood is being carried out.

With the object of immunizing adult cattle against piroplasmosis and anaplasmosis, an attenuated strain of *Anaplasma centrale* was established at Salisbury and is being used in cross-experiments with a local strain of *A. marginale*. *B. bigemina* dies out in drawn blood within two days: this constitutes a great hindrance in the use of a mixed virus vaccine and attempts to increase the viability are being made.

With regard to the possible danger to cattle of eating green food previously sprayed with arsenic to kill locust hoppers, a series of oxen were given single doses of the poison (containing 80 per cent. arsenious oxide) *per os*. A dose of 112·5 grains of As_2O_3 caused death in 40 hours, a dose of 56·25 grains proved fatal in 73 hours and a dose of 30 grains killed a small ox in 86 hours, but did not kill a heavy beast. Two animals were grazed on a plot previously sprayed with As_2O_3 in accordance with recommendations of the entomological department: one animal ate a little grass only and refused more and would have starved if good fodder had not been supplied. The second beast grazed for one day, but would eat no more and died at the end of 100 hours. It is stated that the kidneys and

omasum were the most satisfactory organs from which to make a chemical diagnosis of arsenical poisoning in the above cases.

Numerous reports from farmers of sterility in cattle due to granular vaginitis were not substantiated on investigation, other conditions of an aetiological significance being found. Granular vaginitis was also common in two herds that were free from breeding troubles.

An eczematous affection of the skin which usually terminated fatally occurred in a herd of young bulls convalescent after an attack of anaplasmosis, and was investigated. A fungus was isolated, but attempts at artificial infection yielded negative results :

"One bull, a particular well marked case of the skin affection, was killed *in extremis*, and at autopsy a few "infarcts," indistinguishable from the so-called infarcts of East Coast Fever, were discovered in one kidney, post-mortem finding otherwise being entirely negative for East Coast Fever. Smears were prepared from blood, lymph glands and spleen, and also from one of the kidney infarcts. Examination of the last-mentioned revealed numerous bodies, both extra- and intra-cellular, which were indistinguishable from the Koch's bodies of East Coast Fever (*Th. parva*). No similar bodies could be found in the other smears after very prolonged search, but in the blood a mixed infection with *Anaplasma*, *B. bigemina* and rare *Th. mutans* was diagnosed.

"This case therefore provides a further example of the development of plasma bodies in the life cycle of *Th. mutans*, as described by Theiler and Graf, and is of particular interest in that kidney "infarcts" (mononuclear infiltrations) were present and in these only were the developmental forms of the parasite encountered."

—J. E.

LECLAINCHE, E. (1934). La situation sanitaire en 1933. **[The Animal Disease Situation in 1933]**.—*Bull. Off. internat. Epiz.* **8.** 1-18 and 459-464. 3 tables, 3 graphs, 4 maps.

This is a report for 1933 by the Director of the Office International des Epizooties, each disease being dealt with individually.

It is a most valuable record of the incidence of the important contagious diseases of animals in the countries of Europe for the year : the original must be consulted for details. The diseases dealt with include anthrax, tuberculosis, swine erysipelas, glanders, swine plague, fowl cholera, pullorum disease, bovine contagious abortion, blackleg, dourine, foot and mouth disease, contagious bovine pleuro-pneumonia, equine infectious anaemia, Aujeszky's disease, rabies, sheep pox, fowl pox and fowl plague.

FOOT AND MOUTH DISEASE.—There was little change in the geographical distribution but there was an increase in its incidence in the Netherlands.

SHEEP POX is mainly restricted to the Mediterranean countries.

ANTHRAX is well under control.

SWINE DISEASES.—There is still much confusion in many countries in connection with diseases of swine and it is difficult, from some of the reports received, to differentiate the several porcine diseases.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA has reappeared in Poland. In the discussion that followed MARCZEWSKI gave the following details. Poland was free from the disease from 1929 to 1933. The outbreak was diagnosed in 1933 and all affected herds were destroyed revealing 9·8 per cent. of cases at autopsy. The method of its introduction into Poland is unknown, and it is suggested that the outbreak may have started from an animal which had survived the previous measures against the disease. Russia and Spain are the only other European countries where contagious bovine pleuro-pneumonia occurs.

RABIES still remains a problem in Europe. Compulsory inoculation of all dogs in every country where rabies is endemic provides the only hope of eradication.

TUBERCULOSIS.—There has been noticeable activity in many countries towards effective prophylactic measures against this disease.—HARVEY S. PURCHASE.

HOLLAND. (1934). Mededeelingen betreffende den Gezondheidsdienst voor Vee in Friesland. Vijftiende Jaarverslag 1933-1934. [**Communications on the Health Service for Livestock in Friesland. 15th Annual Report 1933-1934**]. pp. 32. 4 tables.

In this great dairying district, all cattle are tuberculin tested annually. The returns are given here under headings of groups (dairy companies) and individuals. The number of reactors varied widely between 1 and 30 per cent. A supplementary leaflet gives a very long list of farmers having herds free from tuberculosis. Bovine tuberculosis has decreased considerably in Friesland in the last decade.

Some tests on the efficiency of pasteurization of tuberculous milk are described, the Storch chemical test for the degree of temperature reached in the course of heating and the guinea pig test being employed as criteria. It was found that the latter was always negative when the former was negative, the temperature required for the killing of tubercle bacilli being about 8°C. below that at which the Storch test becomes negative (at about 84°C.). [This suggests that, for high temperature pasteurization, the Storch test can be used as an efficient indicator of innocuity].

Johne's disease is increasing in Friesland, 20 per cent. of samples of material examined being positive during the year.

About 3 per cent. of sera examined were positive for *Br. abortus* infection.

The diagnostic returns for milk, tests of water supplies, and diseases of calves and pigs are also given. In addition many kinds of specific antisera were made and issued.—J. E.

FRENCH WEST AFRICA. (1934). Rapport d'ensemble sur le fonctionnement des Services de l'Elevage en Afrique Occidentale Française pendant l'année 1933. [CURASSON, G.] [**Report of the Livestock Services of French West Africa for 1933**]. pp. 41. 4 tables. Mimeographed. [fcp].

This report covers French West Africa as a whole, which includes the colonies of French Sudan, Niger, Senegal, French Guinea, Mauritania, Dahomey and the Ivory Coast.

The European veterinary staffs total 33, the European stock inspectors 30 and the native veterinary assistants, trained at Bamako, 30.

INFECTIOUS DISEASES.

RINDERPEST.—The incidence in the various colonies is described : the disease is endemic in most parts. Outbreaks continually occur and are treated by various methods of immunization – sero-vaccination for in-contact herds and vaccination (formol-vaccine) sometimes followed by infection for use as a systematic measure, chiefly of herds close to frontiers of foreign territory.

It is estimated that the mortality from rinderpest, reckoned on all cattle in French West Africa, is 1 to 1·5 per cent.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA is not present in Dahomey or Guinea and is practically unknown in Mauritania. A few isolated cases occurred in Niger and French Sudan, whilst the Ivory Coast is more severely infected. A formolized vaccine is used for immunization purposes and it is stated that " novarsenobenzol " gave very good results in the treatment of animals already affected. One officer, M. AILLERIE, also claimed good results with " stovarsol " and with colloidal silver alternated with convalescent serum.

RABIES.—A few odd cases were reported from Niger, the Ivory Coast, French Sudan and Senegal.

Blue Tongue was only observed in French Sudan.

Sheep Pox was observed for the first time in Niger, being characterized by nervous symptoms as in the French Sudan.

Foot and Mouth Disease occurred in a mild form without causing appreciable loss.

Horse-Sickness occurred occasionally in Senegal, but was not observed elsewhere.

Pleuro-Pneumonia of Goats only occurs in large flocks and is most common in Niger.

Anthrax was reported for the first time in Niger in sheep. It is endemic in French Guinea and occasionally occurs in French Sudan and Senegal.

Blackleg has been observed in all colonies except French Sudan and Dahomey.

Caseous Lymphadenitis is wide-spread, but research on cases in French West Africa has shown the causal organism to be the micrococcus of Morel-Aynaud and not the Preisz-Nocard bacillus.

Tuberculosis has been observed in cattle in Niger, French Sudan and Senegal, in swine in French Sudan and in fowls in the Ivory Coast.

Pasteurellosis was observed for the first time in cattle in Niger and also in sheep; it was seen in cattle, swine and fowls in the Ivory Coast, in cattle in Dahomey and in cattle and sheep in French Sudan.

Epizootic Lymphangitis is common and is treated with biniodide of mercury.

Black Disease of Sheep was only observed in French Sudan.

Trypanosomiasis is considered to be wide-spread. Data collected at the various clinics show that *T. cazalboui* [*vivax*], *T. dimorphon*, *T. pecaudi*, *T. brucei* and *T. theileri* occur in cattle and *T. dimorphon*, *T. brucei* and *T. soudanense* in horses.

Babesiasis.—*B. bigemina*, *B. canis* and *Anaplasma marginale* occur in the Ivory Coast, and *B. bigemina* in Guinea and French Sudan. *B. equi* was observed for the second time in ten years in French Sudan.

Coccidiosis is sometimes observed as an infection superimposed on rinderpest.

Mange.—Chorioptic mange is common, but benign in cattle; sheep scab has not been observed, but sarcoptic mange occurs in sheep and goats.

Livestock Establishments.

Each colony has an experimental farm devoted chiefly to the improvement of breeds of cattle, sheep and pigs. The work of each is described.

Laboratories.

Each colony, except Mauritania, which shares one with Senegal, has a diagnostic laboratory and some of them are also engaged on serum and vaccine production. The laboratory at Bamako (French Sudan) is the most important and includes a veterinary school for natives as well as a clinic. Research work on rinderpest and other diseases is also carried out.

Livestock Industry.

The estimated numbers of cattle, horses, donkeys, sheep, goats and camels of each colony are given: these total, for the whole territory (French West Africa), 3,800,000 cattle, 195,000 horses, 466,000 donkeys, 12,300,000 sheep and goats and 134,000 camels. Many thousands of ruminants are exported annually by sea and into adjoining foreign colonies, particularly the Gold Coast and Nigeria.

Considerable sums of money are to be expended on increasing the water supply by the construction of wells in the various colonies in the immediate future.

—J. E.

BOOK REVIEWS.

HEWER, E. E. [D.Sc., Reader in Histology, Univ. London and Assistant Lecturer in Physiol., London (Royal Free Hospital) School of Med. for Women], & SANDES, G. M. [F.R.C.S., M.B., B.S., Demonstrator in Anatomy, London (Royal Free Hospital) School of Med. for Women and Surgeon London Lock Hospital for Women and Children]. (1933). **An Introduction to the Study of the Nervous System.** pp. 147. 65 figs., 2 tables, 1 appendix. [79 refs.] London: William Heinemann (Medical Books) Ltd. [2nd Edit.] [4to] [21s.]

In these days, when steady and continuous advances are being made in the knowledge of the minute anatomy and physiology of the nervous system, it is a great advantage to students to have books which embody the more recent knowledge in such a form that it is readily assimilable. Hewer and Sandes in this second edition of their book have found it necessary to modify the original text in order to bring it into line with present knowledge, although the first edition of the work is only four years old.

The book is written primarily for students and the text is admirably illustrated by diagrams. The subject is dealt with briefly and concisely in order that a clear picture may be presented. It brings together much valuable information which is to be found in the larger text-books and journals. No description of gross structure is given and the book has to be read in conjunction with text-books dealing with this aspect.

The book is divided into two parts, the first containing 11 chapters and the second, 13. The first part deals more particularly with minute structure and the second part more particularly with function. The clinical application of knowledge of structure and function is indicated throughout the book.

The diagrams should prove very helpful, as they are particularly clear and simple. Two helpful tables are included, the first dealing with efferent and afferent fibres of the cranial nerves, and the second with the efferent and afferent supply, both autonomic and spinal, to and from the various tissues and organs. An appendix outlines some of the simple histological methods of investigating nervous structures and a satisfactory index is supplied.

Although written primarily for medical students and practitioners, the book should prove of great value to students of comparative anatomy and comparative physiology.—L. B. BULL.

CUNNINGHAM, A. [D.Sc., Advisory Bacteriologist, Edinburgh and East of Scotland College of Agriculture]. (1934). **Practical Bacteriology. An Introductory Course for Students of Agriculture.** pp. viii + 203. 26 figs., 8 tables. London & Edinburgh: Oliver & Boyd. [2nd Edit.] [8vo] [7s. 6d.]

The fact that a second edition of this book has been called for is in itself a proof of its usefulness, and a perusal of its contents will immediately dispel any doubts about its merits as an introductory guide for agricultural students.

The subject matter is mainly of a general nature, comprising the preparation of media, the use of the microscope, the staining and examination of cultures, colony formation, etc. Various forms and types of apparatus are very clearly described. Chapters are also devoted to the bacteriology of milk, dairy products and water; soil and farmyard manure; plant diseases; there is brief mention of the bacteriology of animal diseases.

As a text-book for agricultural students it seems to be ideal and it presents a wealth of useful information in a lucid manner within a handy compass. The

matter is very well presented and the publishers have done their part well.

—GWILYM O. DAVIES.

MACKIE, T. J. [M.D., D.P.H., Professor of Bacteriology, University of Edinburgh], & MCCARTNEY, J. E. [M.D., D.Sc., Director of Research and Pathological Services, London County Council]. (1934). **An Introduction to Practical Bacteriology. A Guide to Bacteriological Laboratory Work.** pp. viii + 504. 18 figs., 18 tables. [44 refs.] Edinburgh : E. & S. Livingstone. [4th Edit.] [8vo] [12s. 6d.]

This being the fourth edition of a very popular little book it calls for little or no comment as to the nature of the subject matter. It has been completely revised and brought up-to-date and in addition has been improved by grouping the various subjects into three parts. The first is of an introductory nature, the second deals with bacteriological technique and the third is devoted to pathogenic micro-organisms and bacteriological diagnosis.

In a book of this type into which so much useful information has been compressed a few minor errors are bound to creep in. One such error occurs in the section on canine distemper on page 477 where the vaccine is stated to consist of formolized liver instead of spleen and mesenteric glands. The same error is made in describing the origin of the virus used in immunization.

However, as a student's guide to bacteriological work and study in the laboratory this book should prove to be invaluable and should find a place on most laboratory benches. Even to the more experienced worker, it should prove a very useful memory refresher on the technical aspect of bacteriology.

—GWILYM O. DAVIES.

SCHÖNBERG, F. [Polizeiveterinärrat and Director State Veterinary Diagnostic Office for Food Control, Berlin]. (1934). Ueber die Entstehung von Fleischvergiftungen und ihre Verhütung durch die tierärztliche Fleischuntersuchung. Eine Kurzgefasste Darstellung insbesondere für Fleischbeschautierärzte. [**Meat Poisoning and its Prevention by Veterinary Meat Inspection**]. pp. 36. 4 figs. [106 refs.] Berlin : Richard Schoetz. [8vo].

Following on a short summary of the usual food-poisoning organisms found in meat, the author discusses the appearance of such bacteria in the intestinal flora of healthy and sick animals, together with the methods by which they invade the flesh and organs, especially in cases of " emergency-slaughtered animals." Some interesting diagrams are included which show the varying degrees of infection, and the whole booklet is a concise summary of the latest information regarding food poisoning due to the ingestion of animal flesh. Emphasis is laid on the necessity for bacteriological meat inspection in order to detect carcasses infected with meat-poisoning bacteria.—D. J. ANTHONY.

LEPLAE, E. [Prof. at Louvain Univ., Hon. Direct. Gen. at the Belgian Foreign Office], & TOBBACK, L. [Dr. Med. Vet. attached to the Belgian Foreign Office]. (1933). Organisation et Exploitation des Elevages au Congo Belge. I. Bêtes Bovines. II. Traitement des Maladies du Bétail des Tropiques. [**Organization and Exploitation of Animal Husbandry in the Belgian Congo. I. Cattle. II. Treatment of Animal Diseases in the Tropics**]. pp. 500. 123 figs., 79 tables. Brussels : Imprimerie Industrielle et Financière. [2nd Edit.] [8vo] [Fr. 35].

This work would be of use in the hands of anyone interested in cattle, going out to Central Africa for the first time, whether a veterinarian or layman. In many

respects it is a " farmer's or rancher's guide ", but there are portions which would be difficult for a layman to understand. The work is in two parts.

The first part, by Leplae, deals fairly clearly with the types of cattle required in different localities and for various uses. The author favours Aberdeen Angus, Shorthorns and Herefords for crossing with the indigenous cattle. A short description is given of the different types of veldts and how best to conserve and utilize them. Tropical fodder crops are described and it is worthy of note that the use of silage is advised.

The second part, by Tobback, deals with diseases and pathological conditions. It is reported that tuberculosis and contagious granular vaginitis have been diagnosed in the Congo. A condition named " Dermatose des bovidés " occurring in Angola and the Belgian Congo resembles remarkably the " Senkobo skin disease " of Northern Rhodesia. The causation is suspected, as in Senkobo, of being associated with ticks. The causal organism is suspected of being a bacterium, " *Dermatophilus congolensis* " (van Saceghem). Considerable space is given to mastitis but this condition is not so frequently seen in indigenous cattle as one would be led to believe from the space allotted to it. Grass tetany of milch cows is described separately, but its differentiation from milk fever, which is described elsewhere, is not given. " Sweating sickness " is reported to have caused the death of 136 calves at Katentania Station in 1932. *Ixodes pilosus* has been found on cattle in the Congo. It is difficult to see why " three days' sickness " is classed as a dietetic condition after the author has stated in another part that it can be transmitted by blood inoculation.

[No mention is made of onchocercosis of cattle, which is not rare in this region of Africa].

The photographs and drawings serve their purpose well although more photographs of the indigenous cattle and fewer of the European breeds would have been preferable.—HARVEY S. PURCHASE.

RENNES, J. [Director of Veterinary Services, Seine-et-Oise]. (1934). Production-commerce et contrôle hygiénique du lait. **[The Milk Industry and its Hygienic Control].** pp. 238. Paris : Vigot Frères. [8vo] [Fr.25].

The author divides his subject primarily into three parts, namely :– (1) the production of milk ; (2) the commercial aspect of milk production and (3) the hygienic control. Each aspect is dealt with in a detailed manner both from the theoretical and the practical standpoint.

The book commences with a description of the requirements of cow-sheds, the dairy and all accessory buildings and conveniences connected with a milk farm. Methods of obtaining cleanliness and of carrying out disinfection on farm premises are described in detail, types of pastures suitable for dairy cows are discussed and systems of feeding with examples of rations are given. Great care is taken to describe how cattle should be prepared for milking and how milking should be carried out, both by hand and by means of milking machines and a description of milking machines is added. This is followed by details of the various methods of treating milk, cooling, heating, pasteurization, sterilization and stassanization which occupy 85 pages.

The second part, occupying 20 pages, describes the commercial methods adopted in France, both in the town and in the country. It is stated that in France there are about eight million cows in milk which give annually about 149 million hectolitres, or just over 1,700 litres per head [roughly 378 gallons] – a very poor yield – but it is added that statistics of this nature are very difficult to obtain. Of this quantity, 43 million hectolitres are consumed as liquid milk, 21 millions are

manufactured into cheese, 45 millions into butter and 31 millions are utilized for calf feeding.

The chief section of the work is devoted to the public health control of the milk industry and runs into about 124 pages. After a historical account of the control in various countries, a most interesting summary is given of the methods adopted in the following countries :– Holland, Sweden, Norway, Uruguay, Switzerland, Chili, Belgium, Italy, Germany, Denmark, England, the United States of America, and Canada. Lastly, a very full account of the methods practised for the supervision and control of milk in France is detailed. Extracts from the French legislation as it affects the milk supply are given, and the book ends with a short recital of the results obtained from milk control in France and its future possibilities.

The publication is well printed, produced on excellent paper and contains a useful index.—D. S. RABAGLIATI.

WIRTH, D. [Prof. in Charge of Instruction in Internal Medicine and of the Medical Clinic of the Veterinary College, Vienna]. (1934). Einführung in die Klinische Diagnostik der inneren Erkrankungen und Hautkrankheiten der Haustiere. **[Introduction to Clinical Diagnosis of the Internal Diseases and Skin Diseases of the Domestic Animals].** pp. 180. 115 figs., 1 table. Berlin & Vienna : Urban & Schwarzenberg. [8vo] [RM.6].

This book is the embodiment of lectures and demonstrations in the principles of clinical diagnosis for veterinary students and represents the fruits of 15 years' experience of teaching by the author.

The various methods of clinical diagnosis, including information on the help to be obtained from certain auxillary specialities, such as urine analysis, haematology, etc., useful for the examination of parts of the body of domestic mammals and fowls, are described concisely *seriatim.* The numerous figures are a necessary and successful complement to the text.

The book will be a valuable asset to veterinary students and a refresher for practitioners, and the very low price makes it available to all.—J. E.

LABBÉ [Prof. Clin. Med., Fac. Med., Paris], & FABRYKANT [Assistant Prof. Clin. Med., Fac. Med., Paris]. (1933). Le Phosphore. **[Phosphorus].** pp. 395. 79 tables. [27 pp. refs.] Paris : Masson & Cie. [8vo] [Fr.55].

The authors survey a wide field of literature and present their views on the significance of phosphorus in physiology and pathology. The point of view is medical and the extensive recent veterinary and agricultural literature is hardly taken into account at all.

The monograph commences with an indication of the nature of biologically important phosphorus compounds, discusses sources in foods, proceeds to P-partition in the organism, physiological role of P, intermediary metabolism, variations of blood P in health and disease and elimination in urine and faeces. Pages 209-345 then proceed to a consideration of phosphorus in pathology, discussing rickets, hypervitaminosis D, tetany, acromegaly, Recklinghausen's disease, Paget's disease, osteomalacia, chronic rheumatism, diseases of haemopoietic tissue, diabetes, diseases of liver and kidneys, phosphaturia, and urinary calculi. A short final chapter deals with phosphorus compounds in therapeutics.

Each section is provided with its own bibliography, a supplementary alphabetical author index with page references being supplied on pp. 381-389.

—H. H. GREEN.